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I, Dr. Henry H. Houh, do hereby declare as follows:

I. INTRODUCTION

1. I am making this declaration at the request of Peloton Interactive, Inc. to provide additional opinions concerning the validity of U.S. Patent No. 7,166,062 (“the ’062 Patent”).

2. I provided another declaration concerning the validity of the ’062 Patent in IPR2021-00342.

3. I am being compensated for my work in this matter at my standard hourly rate. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony. My compensation is not contingent on the outcome of this matter or the specifics of my testimony.

4. I have been asked to provide my opinions regarding the validity of claims 1, 3-5, 8-11, 15-16, 21-23, 26-28, 30, 36, 38, 40, 45, 46, 48-50, 52, 54, 56-57, 59, 61, 78-85, 87, 89-90, and 92-95 (“the Challenged Claims”) of the ’062 Patent. It is my opinion that the Challenged Claims would have been obvious to a person having ordinary skill in the art (“POSITA”) at the time of alleged invention in view of the prior art.

5. In the preparation of this declaration, I have studied:

- a. the ’062 Patent, Ex. 1001;
- b. the prosecution history of the ’062 Patent, Ex. 1002;

- c. U.S. Patent No. 6,152,856 (“Studor”), Ex. 1005;
- d. U.S. Patent No. 6,053,844 to Clem (“Clem”), Ex. 1012
- e. U.S. Patent No. 6,059,692 to Hickman (“Hickman”), Ex. 1013

6. In forming the opinions expressed below, I have considered: the relevant legal standards, including the standard for obviousness; my own knowledge and experience based upon my work in the field of optical communication as described below; the documents listed above; and any additional documents as cited in this declaration.

7. Unless otherwise noted, all emphasis in quoted material was added.

II. QUALIFICATIONS AND EXPERIENCE

8. My qualifications and professional experience are described in my *curriculum vitae*, a copy of which is submitted as Exhibit 1004.

9. I received a Ph.D. in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology (“MIT”) in 1998. Beforehand, I received a Master of Science degree in Electrical Engineering and Computer Science in 1991, a Bachelor of Science degree in Electrical Engineering and Computer Science in 1989, and a Bachelor of Science degree in Physics in 1990, all from MIT.

10. I am currently self-employed as an independent technical consultant. I am also president of a company that provides supplemental science, technology, engineering, and mathematics (“STEM”) education to children of all ages.

11. I first entered telecommunications in 1987 when I worked as a summer intern at AT&T Bell Laboratories as part of a five-year dual degree program at MIT. I continued to work at AT&T Bell Laboratories as part of this MIT program. While at MIT, I was a teaching assistant (“TA”) in the Electrical Engineering and Computer Science Department’s core Computer Architectures course. I first was a TA as a senior for a role typically reserved for graduate students. I later became head TA. The course covered various topics in computer architectures. As a TA, I helped write homework assignments, lab assignments, and exams. I also taught in the recitation sections.

12. Later, as part of my doctoral research at MIT from 1991-1998, I was a research assistant in the Telemedia Network Systems (“TNS”) group at the Laboratory for Computer Science. The TNS group built a high-speed gigabit network and created applications that ran over the network. Example applications included ones for remote video capture, processing, and display of video on computer terminals. In addition to working on the design of core network components, designing and building the high-speed links, and designing and

writing the device drivers for the interface cards, I also set up the group's web server.

13. I also helped to build the web pages that initiated the above-mentioned video sessions via a web interface. Vice President Al Gore visited our group in 1996 and received a demonstration of—and remotely drove—a radio-controlled toy car with a wireless video camera mounted on it that was built by our group. This toy car device received commands transmitted over a network from a remote computer, and video data from the toy car was transmitted wirelessly then over a computer network back to the user controller. On occasion, we allowed users visiting our web site to drive the toy car from their remote computer while they watched the video on their computer. The video stream was encoded by TNS-designed hardware, streamed over the TNS-designed network, and displayed using TNS-designed software.

14. I defended and submitted my Ph.D. thesis, titled “Designing Networks for Tomorrow’s Traffic,” in January 1998. As part of my thesis research, I analyzed local area and wide area flows to show a more efficient method for routing packets in a network, based on traffic patterns at the time.

15. From 1997 to 1999, I was a Senior Scientist and Engineer at NBX Corporation, a start-up that made business telephone systems for streaming packetized audio over data networks instead of using traditional telephone lines.

NBX was later acquired by 3Com Corporation and the phone system is still used today by numerous businesses.

16. As part of my work at NBX, I designed the core audio reconstruction algorithms for the telephones, as well as the packet transmission algorithms. I also designed and validated the core packet transport protocol used by the phone system. The protocol was used for all signaling in the phone system, including for the setup of conference calls. The NBX system also featured a computer interface for initiating phone calls, which could also initiate conference calls. The NBX system also supported the Telephony Application Programming Interface (“TAPI”) that allowed other computer programs to integrate with our system telephony features. We obtained U.S. Patent No. 6,697,963, entitled “Telecommunication method for ensuring on-time delivery of packets containing time-sensitive data,” as part of this work.

17. From 1999-2004, I was employed by Empirix or its predecessor company, Teradyne. Empirix was a leader in test tools for telecommunications protocols and systems, providing functional testing tools as well as load testing tools. From 2000-2001, I conceived and built a test platform for testing Voice-over-IP (VoIP). The first application on this new test platform was a cloud emulator for simulating the effects of transmitting VoIP over a busy network.

18. In 2006, as part of my role at BBN Technologies, I helped found PodZinger Inc., now known as RAMP Inc. PodZinger utilized BBN's speech recognition algorithms to search through the spoken words in audio and video segments. While I was Vice President of Operations and Technology, PodZinger followed its initial prototype with a full streaming audio and video search solution. I also created a social networking web site, which BBN sold to a venture-funded startup company. In the process of creating the web site, I designed and specified the authentication and authorization protocols.

19. I have been awarded several United States patents, and I have several patent applications pending including the following examples:

- U.S. Patent No. 7,975,296, "Automated security threat testing of web pages";
- U.S. Patent No. 7,877,736, "Computer language interpretation and optimization for server testing";
- U.S. Patent No. 7,801,910, "Method and apparatus for timed tagging of media content";
- U.S. Patent 7,590,542, "Method of Generating Test Scripts Using a Voice-Capable Markup Language";
- U.S. Patent No. 6,967,963, "Telecommunication method for ensuring on-time delivery of packets containing time-sensitive

data”;

- U.S. Patent Application Publication No. 20070106685, “Method and apparatus for updating speech recognition databases and reindexing audio and video content using the same”;
- U.S. Patent Application Publication No. 20070106693, “Methods and apparatus for providing virtual media channels based on media search”;
- U.S. Patent Application Publication No. 20070106760, “Methods and apparatus for dynamic presentation of advertising, factual, and informational content using enhanced metadata in search-driven media applications”;
- U.S. Patent Application Publication No. 20070112837, “Method and apparatus for timed tagging of media content”;
- U.S. Patent Application Publication No. 20070118873, “Methods and apparatus for merging media content”; and
- U.S. Patent Application Publication No. 20090222442, “User-directed navigation of multimedia search results”.

20. Further details are provided in my *curriculum vitae*. Ex. 1004.

III. RELEVANT LEGAL STANDARDS

21. As already noted, I have been asked to provide my opinions regarding the validity of the Challenged Claims of the '062 Patent.

22. I am not an attorney. In preparing and expressing my opinions and considering the subject matter of the '062 Patent, I am relying on certain basic legal principles that counsel have explained to me. These principles are discussed below.

23. I have been informed by counsel and understand that prior art to the '062 Patent includes patents and printed publications in the relevant art that predate the claimed priority date of the alleged invention recited in the '062 Patent. For purposes of this declaration, I am applying July 8, 1999, as the earliest priority date of the '062 Patent.

24. I have been informed by counsel and understand that a claimed invention is unpatentable for obviousness if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious to a POSITA at the time the invention was made. I understand that a claimed invention can be obvious from a single prior art reference or from a combination of two or more prior art references.

25. I have also been informed by counsel and understand that the obviousness analysis takes into account factual inquiries, including the level of

ordinary skill in the art, the scope and content of the prior art, and the differences between the prior art and the claimed subject matter.

26. I have also been informed by counsel and understand that several rationales are recognized for combining the teachings of different references or modifying a reference to show obviousness of a claimed invention. These rationales include the following: (a) combining prior art elements according to known methods to yield predictable results; (b) simple substitution of one known element for another to obtain predictable results; (c) use of a known technique to improve a similar device (method, or product) in the same way; (d) applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (e) choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; and (f) some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify a prior art teaching or to combine multiple prior art teachings to arrive at the claimed invention.

27. While it may be helpful to identify a reason for a combination, I understand that there is no rigid requirement to find an express teaching, suggestion, or motivation to combine within the references. When a product is available, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a POSITA can implement a predictable

variation, obviousness likely bars its patentability. For the same reason, if a technique has been used to improve one device and a POSITA would recognize that it would improve similar devices in the same way, using the technique would have been obvious. I understand that a claimed invention is obvious if a POSITA would have had reason to combine multiple prior art references or add missing features to reproduce the alleged invention recited in the claims.

28. I have also been informed by counsel and understand that obviousness does not require physical combination of components, or bodily incorporation, of one device into another. Instead, obviousness considers what the combined teachings would have suggested to a POSITA at the time of the alleged invention.

29. I have been informed by counsel and understand that in considering the question of obviousness, it is important to avoid using hindsight derived from the patent being considered.

30. I have also been informed by counsel and understand that certain factors, which a Patent Owner has the burden to show, may support or rebut the obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the patented invention, skepticism of those having ordinary skill in the art at the time of invention, unexpected results of the invention, any long-felt but unsolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the

alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I understand that there must be a nexus—a connection—between any such secondary considerations and the alleged invention. I also understand that contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

31. The analysis in this Declaration is in accordance with the above-stated legal principles.

IV. LEVEL OF ORDINARY SKILL IN THE ART

32. I understand that the level of ordinary skill may be reflected by the prior art and that a POSITA would have the capability of understanding the scientific and engineering principles applicable to the art and the claimed invention. I understand that one of ordinary skill in the art has ordinary creativity and is not a robot.

33. I understand there are multiple factors relevant to determining the level of ordinary skill in the art, including (1) the levels of education and experience of persons working in the field at the time of the invention; (2) the sophistication of the technology; (3) the types of problems encountered in the field; and (4) the prior art solutions to those problems. There is likely a wide range of educational backgrounds in the technology field pertinent to the '062 Patent.

34. As discussed above and detailed in my *curriculum vitae*, I am very familiar with the remotely controlled devices art that is pertinent to the '062 Patent. I am also aware of the state of the art as of the earliest claimed priority date. Specifically, my experience in the field, including with colleagues from academia and with engineers practicing in the industry, during the relevant timeframe allowed me to become personally familiar with the knowledge and capabilities of a POSITA.

35. A POSITA in the field of the '062 Patent, as of its earliest claimed priority date of July 8, 1999, would have been someone knowledgeable of and familiar with remotely controlled devices that are pertinent to the '062 Patent. A POSITA would have had a four-year degree from an accredited institution (a Bachelor of Science degree and denoted "B.S.") in computer science, computer engineering, electrical engineering, or the equivalent and experience with, or exposure to, computer software and computer networks. Additional graduate education could substitute for professional experience, while significant experience in the field might substitute for formal education. I believe that I possess such experience and knowledge, and I am qualified to opine on the '062 Patent.

36. Certain of the challenged claims also relate to exercise workouts and personal training sessions that the exercise equipment displays. As a result, I agree

with Mr. Rutberg that the “art” is a hybrid of (1) engineering and (2) exercise training. As such, a POSITA would also have had some skill regarding exercise training.

37. I do not have an opinion regarding the level of skill of a POSITA regarding exercise training, though I conclude that at least some education and/or professional experience is necessary for some of the claims. I do not have an opinion regarding how much, and such an opinion would be beyond my level of expertise. I have not been asked to, and do not offer any opinions on exercise training topics. My opinions are limited to engineering topics. I rely upon Mr. Rutberg’s declaration for any opinions related to exercise training.

38. I understand that Mr. Rutberg offers an opinion that a POSITA would also have had at least a Bachelor’s degree in the exercise field (*e.g.*, Exercise Physiology or similar) or at least two years’ experience in the exercise field (as, *e.g.*, personal trainer, coach, fitness instructor, etc.). Rutberg Decl. ¶¶ 27-41.

39. For purposes of this Declaration, and unless otherwise noted, my statements and opinions, such as those regarding my experience and understanding of a POSITA generally (and specifically related to the references I consulted herein), reflect the knowledge that existed in the field as of July 8, 1999. This is true even if the testimony is stated in the present tense.

V. STATE OF THE ART

40. The “dot-com boom” started in 1995, during which Internet-related companies found huge growth based on heavy investment from the financial sector. Growth in access to the World Wide Web fueled the popularization of the Internet. As a result, venture capital was easy to raise for Internet-related companies, which led to the growth of Internet-related technology. By July 1999, the dot-com boom was reaching its peak.

41. Consequently, it was more than obvious for engineers at the time to develop Internet-related functionality in all sectors of technology. Adding a modem to electronic devices to allow them to connect to the Internet became commonplace. For example, Studor noted that “internet/modem racing, and other features may be provided in enhanced embodiments of the exercise system 10.” Ex. 1005, 6:46-48.

42. A modem connects a local network to the Internet. Modems convert data from a digital format to one suitable for transmission, creating a packetized data stream. Thus, by July 1999, a POSITA would have known that any data transmitted via the Internet would have been packetized.

43. In fact, packet switching was the well-known basis for the Internet and virtually all computer networks. In particular, Paul Baran, the inventor of packet switching, is recognized by the technology community for laying the

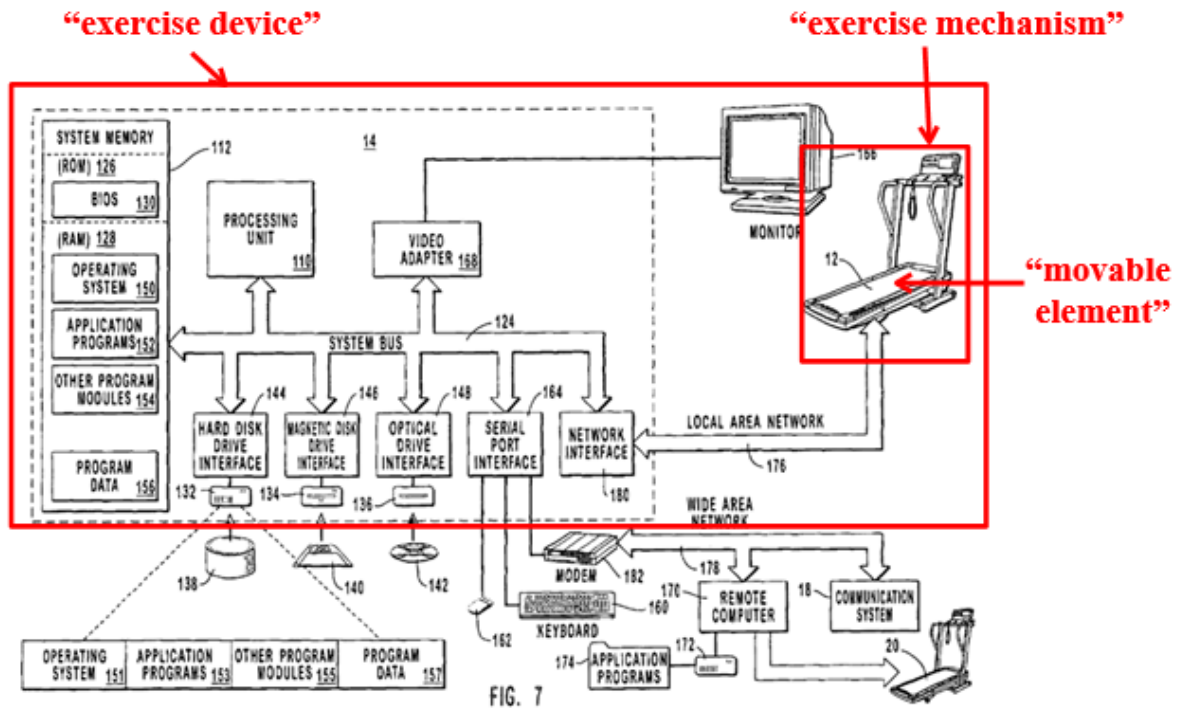
foundation for the Internet. Baran won the IEEE Alexander Graham Bell Medal in 1990 for “pioneering in Packet Switching.” *See* Ex. 10111. The Franklin Institute’s Bower Award and Prize for Achievement in Science in 2001 for the “development of packet switching, foundation of the Internet” (*see* https://www.fi.edu/laureates/paul-baran?winner_id=2272), was made a fellow of the Computer History Museum in 2005 (*see* <https://computerhistory.org/press-releases/an-evening-with-paul-baran/>), and received the National Medal of Technology and Innovation in 2007.

44. In one of his patents, Baran teaches that: “It is another object of the present invention to provide a digital high speed data modem that can operate in the synchronous, asynchronous, and **packet modes**.” Ex. 1007, 7:7-10. “The modem of the present invention handles all data on a **packetized** basis and permits intermixing of a multiplicity of data streams. Each data stream may operate at almost any speed or protocol combination by virtue of **packetization** permitting a degree of flexibility.” Ex. 1007, 10:15-20.

VI. THE ’062 PATENT

45. The ’062 Patent is directed to “exercise equipment and, more specifically, to systems and methods for providing improved exercise devices in combination with other users and/or a live or stored trainer via a communications network.” Ex. 1001, 1:18-23. The ’062 Patent describes and claims an exercise

device that can be controlled remotely by a trainer or website, as well as by the user. Ex. 1001, Abstract, 18:1-14 (“For example, if both the trainer and the user devices are connected to a communication system, such as a website, the website may control the user device and/or the trainer device.”). In one example, the exercise device includes a treadmill 12 and a computer 14 as shown in Fig. 7 below. Such an exercise device includes (1) an “exercise mechanism” with a “movable element” having “operating parameters,” (2) a “user interface” (3) a “communicating mechanism,” and (4) a “controller.”



Ex. 1001, Fig. 7 (annotated)

46. The “movable element” may be a belt, in the case where the exercise mechanism is a treadmill. *See* Ex. 1001, 31:55-56. The movable element has operating parameters “such as speed, inclination, resistance, and the like.” Ex. 1001, 7:67-8:1. To adjust the operating parameters, the exercise device includes a user interface. The user interface “enables a user utilizing the beneficial characteristics of user module 252 to engage and give commands thereto with respect to various operating parameters of user module 252.” Ex. 1001, 31:11-15. Remote control is performed by receiving a remote signal through a communicating mechanism: “a communicating mechanism ... receives a packetized second real-time signal. The second real time signal may comprise a ... control signal ... A processor, responsive to a control signal is configured to control the operating parameters of the exercise mechanism in real-time.” Ex. 1001, 3:42-51.

47. In addition to receiving commands from a user, the operating parameters may be adjusted remotely through a communicating mechanism: “activation of the connection with communication system 18 enables treadmill 12, or other exercise device, to have the potential of being controlled during an exercise program by a third party.” Ex. 1001, 10:35-39. The third party may be, for example, a trainer. *See* Ex. 1001, Abstract. Remote control is performed by receiving a remote control signal through a communicating mechanism: “a communicating

mechanism ... receives a packetized second real-time signal. The second real time signal may comprise a ... control signal ... A processor, responsive to a control signal is configured to control the operating parameters of the exercise mechanism in real- time.” Ex. 1001, 3:42-51.

48. As I explain in this Declaration, there is nothing novel or nonobvious about the Challenged Claims since all the elements were taught in the prior art, and were well-known design options for an exercise system that could be controlled by the user or by a third party remotely.

VII. CLAIM CONSTRUCTION

49. It is my understanding that in order to properly evaluate the validity of the '062 Patent, the terms of the Challenged Claims must first be interpreted. I understand that Peloton’s counsel has taken the position that each term in the Challenged Claims should be given its plain and ordinary meaning.

A. “interface means” (Claim 1)

50. Counsel has informed me that the term “interface means” triggers a rebuttable presumption that it is drafted as means-plus-function claims under 35 U.S.C. 112, sixth paragraph. I understand that such terms must be construed in an IPR to identify a function and corresponding structure.

51. The full recitation of the interface means is “interface means, communicating with the exercise mechanism, for gathering a first signal from the

user.” This term is recited in Claim 1. The specification describes structure for performing the recited function of gathering a first signal from the user: “**User interface 262** is one structure capable of performing the function of interface means for gathering a first real-time signal from the user and also means for reproducing the second signal from the trainer.” Ex. 1001, 31:27-31. The specification also describes structure for performing the recited function of communicating with the exercise mechanism: “The diagnostic control 88, audio input device 90 and video input device 92 are structures capable of performing the function of interface means, communicating with the exercise mechanism, for gathering a first signal from the user.” Ex. 1001, 12:3-7.

52. The specification further states: “user interface 262 may include one or more interface devices as discussed previously, such as one or more audio and video input devices 90, 92 ... as described earlier herein.” Ex. 1001, 31:14-18. The specification states the interface devices include “speed controls 68, incline controls 70, time controls 72, distance controls 74, a start button 76, a stop or pause button 78, and heart rate controls 80.” Ex. 1001, 9:17-42. Audio and video input devices 90, 92 include a microphone and video camera. Ex. 1001, 23:10-14. The interface means may also be a voice activated interface, a touch sensitive interface, and an automatic monitoring system. Ex. 1001, 31:36-40.

53. The specification also states that “user interface 262 may include ... one or more audio and video output devices 94, 96.” Ex. 1001, 31:14-18. But these devices are not used to gather input from the user (“*first signal*”). Accordingly, output devices are not necessary to performing the recited function.

B. “communicating means” (Claim 1) / “communicating mechanism” (Claim 29)

54. Counsel has informed me that “communicating means” triggers, and the term “communicating mechanism” may trigger, a rebuttable presumption that it is drafted as means-plus-function claims under 35 U.S.C. 112, sixth paragraph. I understand that such terms must be construed in an IPR to identify a function and corresponding structure.

55. The full recitation of the communicating means is “communicating means, communicating with the interface means, for receiving a packetized second signal from a remote source over a network, the packetized second signal including one or more packetized control signals.” This term is recited in Claim 1. The full recitation of the communicating mechanism is “a communicating mechanism, communicating with the user interface device, the communicating mechanism receiving a packetized second signal from a remote source over a network.” This term is recited in Claim 29. As such, both recite the function of communicating

with the interface means/user interface device for receiving a packetized second signal from a remote source over a network.

56. The specification describes the structure for performing this recited function: “Computers 14 and/or translator device 13 portions are collectively or individually examples of a communicating mechanism.” Computer 14 includes a network interface or modem: “[C]omputer 14 is connected to the local network 176 through a **network interface or adapter 180** that communicates via one of a variety of communication line connections, such as those described previously. When used in a WAN networking environment such that computer 14 may communicate with communication system 18, computer 14 may include a **modem 182**.” Ex. 1001, 16:10-17.

C. “means . . . for controlling” (Claims 1 and 49) / “control means” (Claims 78 and 83)

57. Counsel has also informed me that the terms “means . . . for controlling” and “control means” triggers a rebuttable presumption that it is drafted as means-plus-function claims under 35 U.S.C. 112, sixth paragraph. I understand that such terms must be construed in an IPR to identify a function and corresponding structure.

58. The full recitation of the means for controlling as recited in Claim 1 is “means, responsive to the packetized second signal, for controlling the operating

parameters of the exercise mechanism.” The full recitation of the means for controlling as recited in Claim 49 is “means, responsive to the synchronized control signals carried by the second signal, for controlling the operating parameters of the exercise mechanism.” The full recitation for “control means” as recited in Claim 78 is “control means communicating with the exercise mechanism, for receiving one or more packetized control signals from the remote communication system indicative of the selected exercise program and for changing one or more operating parameters of the exercise mechanism based upon the selected exercise program and the one or more packetized control signals.” As such, each recites the function responsive to the control signal or receipt of the selected exercise program and control signals, controlling the operating parameters of the exercise mechanism.

59. A controller is the only structure the specification describes for performing these recited functions: “User interface 262, safety module 268, data storage module 266, and/or interface module 270 are examples of **a controller**, responsive to the packetized second real-time signal, configured to control the operating parameters of the exercise mechanism (or exercise module) in real time. Additionally, **such controller** is a structure capable of performing the function of control means, communicating with the exercise mechanism (or exercise module), for receiving one or more packetized control signals from the communication system (or communication module) indicative of the selected exercise program and

for changing one or more operating parameters of the exercise mechanism (or exercise module) based upon the selected exercise program and the one or more packetized control signals.” Ex. 1001, 33:22-34.

D. “means for reproducing the second signal” (Claims 21-22, 49, 59)

60. Counsel has also informed me that the term “mean for reproducing the second signal” triggers a rebuttable presumption that it is drafted as means-plus-function claims under 35 U.S.C. 112, sixth paragraph. I understand that such term must be construed in an IPR to identify a function and corresponding structure.

61. The full recitation of the means for reproducing is “means for reproducing the second signal.” The specification describes structure for performing this recited function: “Generally, the output devices described herein are each structures capable of performing the function of means for reproducing a signal. The output devices and hence the means for reproducing a signal may have various configurations as known to one skilled in the art in view of the teaching contained herein. In one embodiment, one video output device 94 may be a video display.” Ex. 1001, 12:61-13:1. The specification also describes the user interface 262 as corresponding structure insofar as it includes output devices to reproduce a signal. Ex. 1005, 31:27-31 (“User interface 262 is one structure capable of

performing the function of interface means for gathering a first real-time signal from the user and also means for reproducing the second signal from the trainer.”). The specification further explains that the audio and video output devices 94, 96 include hardwired and wireless speakers, computer speakers, and audio system speakers, as well as a liquid crystal display (LCD), cathode ray tube (CRT) display, electroluminescent display (ELD), gas-plasma display, thin film transistor (TFT) display, and virtual reality (VR) display. Ex. 1001, 13:11-44.

VIII. GROUND 1: THE CHALLENGED CLAIMS ARE OBVIOUS OVER STUDOR ALONE OR IN VIEW OF THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART

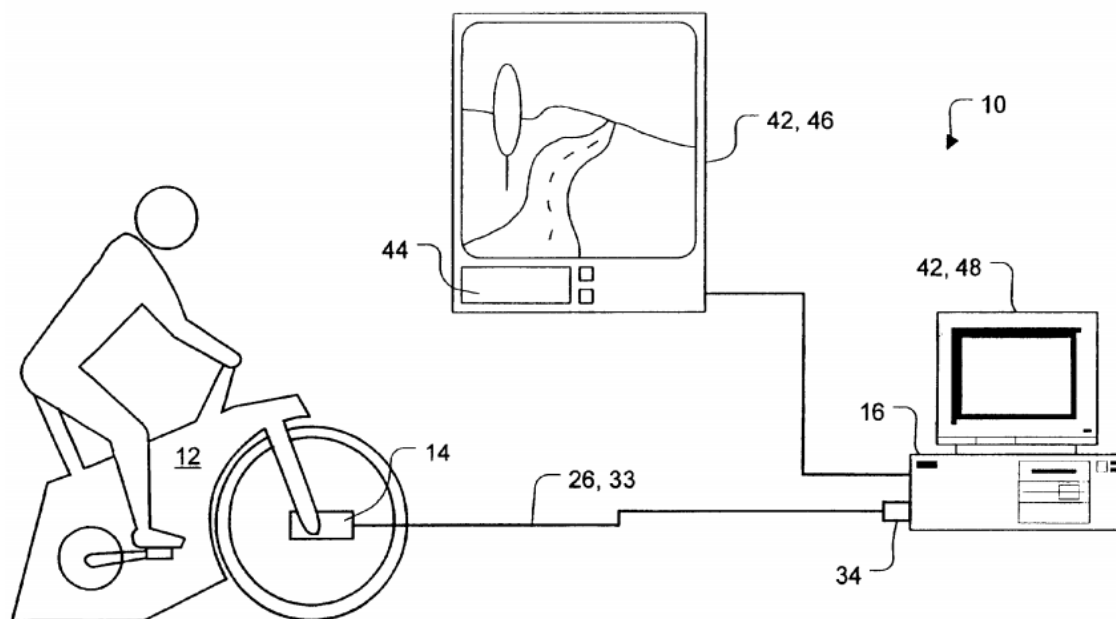
62. Below, I provide an analysis of how Studor alone or in view of the knowledge of a person of ordinary skill in the art renders obvious the Challenged Claims.

A. Summary of Studor

63. Studor relates to “an interactive exercise system.” Ex. 1005, Abstract. Studor notes that people face challenges with exercising such as “boredom, self consciousness, the difficulty or inability to go somewhere to exercise, and even complex social pressures.” Ex. 1005, 1:33-35. “[T]hose who do exercise at home typically do not find that they enjoy or can stick with exercise there for very long.” Ex. 1005, 2:35-37. Studor states that “it is an object of the present invention to

provide an exercise system which dynamically simulates exercise in a natural environment.” Ex. 1005, 2:65-67.

64. Studor describes exercise equipment such as a “bicycle” and notes that “treadmills, stairsteppers, rowing machines, ski machines, and other equipment are equally suitable.” Ex. 1005, 4:43-45. The exercise bicycle may include an “adjustable resistance system 22” to provide variable resistance to the pedals (*i.e.*, movable element) of the bicycle. Ex. 1005, 4:48. Studor’s exemplar system is depicted in Fig. 1, below:



Ex. 1005, Fig. 1

65. Studor’s exercise bicycle includes a user interface that allows the user to control the resistance parameters: “The exercise equipment 12 allows the user

to interact directly during exercise with the simulated environment created by the other components of the exercise system 10.” Ex. 1005, 4:38-40. “The user may set a nominal difficulty level for exercise by adjusting the resistance system 22, then, as the exercise equipment 12 is operated.” Ex. 1005, 4:47-50.

66. The user or a remote source can operate exercise equipment 12 using M-S converter 14, which includes a micro controller 28, internal data communication capability, and memory. Ex. 1005, 5:21-24. The M-S converter 14 performs two major roles: “One is to receive commands from the computer system 16 to control the resistance system 22 of the exercise equipment 12, and the other is to acquire data from the speed sensor 24 of the exercise equipment 12, to convert that data as needed, and to then transmit it through a communications link 26 to the computer system 16.” Ex. 1005, 5:4-9.

67. Computer system 16 may also be used “to operate the exercise system 10 and present the user the simulation of a real-world exercise.” Ex. 1005, 4:35-37. Computer system 16 communicates with exercise equipment 12 by sending signals to M-S converter 14 which “may be either integrated into the exercise equipment 12 by the original equipment manufacturer (OEM)” or “retro-fitted to existing exercise equipment 12.” Ex. 1005, 5:10-14.

68. “[N]ot all components of the computer system 16 need to be physically present in one ‘box,’ or even at one location.” Ex. 1005, 8:26-28. “[A]

global implementation of the computer system 16 [] is connected over a network like the Internet.” Ex. 1005, 15:43-45. “[U]sers located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold ‘communal’ exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.” Ex. 1005, 8:31-37.

B. Independent Claim 1 and 29

[1.0]/[29.0] An exercise device configured to enable interaction of a user, the exercise device comprising:

69. **First**, Studor teaches an “*exercise device*” in the form of exercise system 10:

As depicted in FIG. 1, **the exercise system 10 may be viewed as including the following major components: exercise equipment 12**, which is suitably featured or modified; a M-S converter 14, which acquires data from and controls some aspects of the operation of the exercise equipment 12; and a computer system 16, which uses a software program 18 and pre-recorded media 20, to operate the exercise system 10 and present to the user the simulation of a real-world exercise experience.

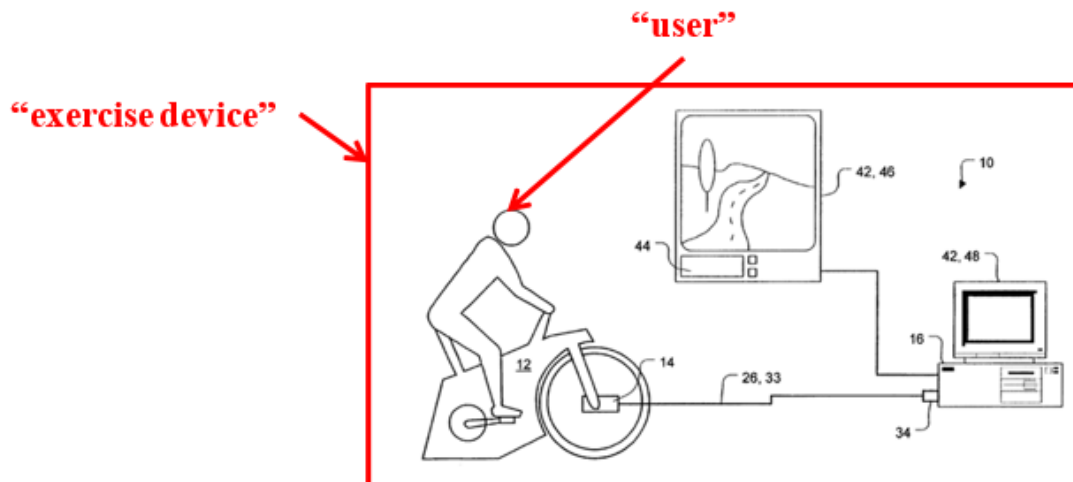
Ex. 1005, 4:28-37.

70. **Second**, the exercise system 10, which includes exercise equipment 12, is “*configured to enable interaction of a user.*”

The exercise equipment 12 allows the user to interact directly during exercise with the simulated environment created by the other components of the exercise system 10. The nature of the specific exercise equipment 12 which is used can vary considerably. FIG. 1 depicts an exercise bicycle being used, but treadmills, stairsteppers, rowing machines, ski machines, and other equipment are equally suitable. The exercise equipment 12 includes, as a minimum, an adjustable resistance system 22 and a speed sensor 24 (FIG. 2). The user may set a nominal difficulty level for exercise by adjusting the resistance system 22, then, as the exercise equipment 12 is operated, the speed sensor 24 provides data from which the user's actual efforts can be inferred.

Ex. 1005, 4:38-51.

71. Studor describes exercise equipment such as a “bicycle” and notes that “treadmills, stairsteppers, rowing machines, ski machines, and other equipment are equally suitable.” Ex. 1005, 4:43-45. The exercise bicycle may include an “adjustable resistance system 22” to provide variable resistance to the pedals (*i.e.*, movable element) of the bicycle. Ex. 1005, 4:48. Studor's exemplar system is depicted in Fig. 1, below:



Ex. 1005, Fig. 1 (annotated)

72. Thus, because Studor teaches an exercise system 10 that includes exercise equipment 12 that allows the user to interact with a simulated environment during exercise, Studor discloses “[a]n exercise device configured to enable interaction of a user” as recited in the claims.

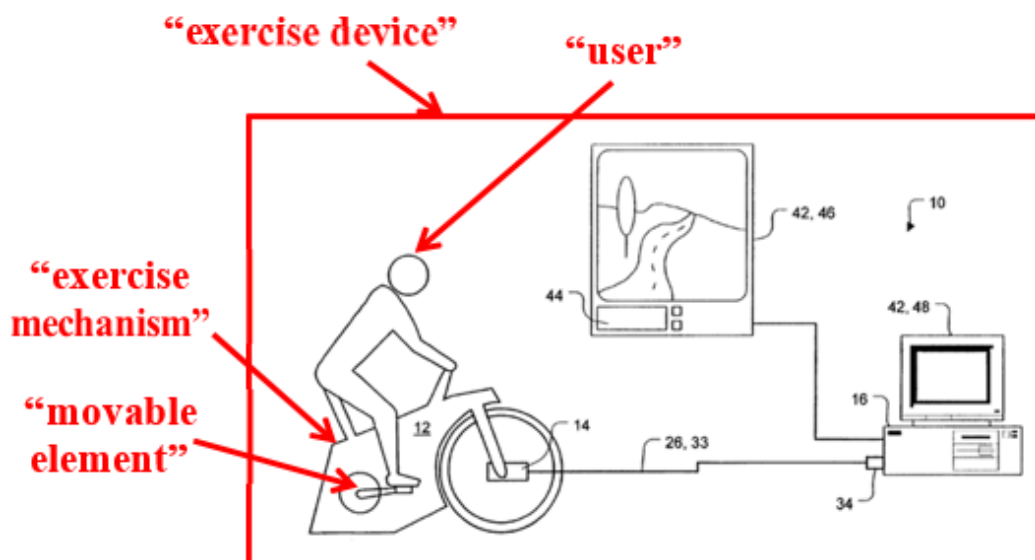
[1.1]/[29.1] (a) an exercise mechanism comprising a movable element for movement in performance of exercise by a user, the exercise mechanism having one or more operating parameters;

73. **First**, Studor teaches “an exercise mechanism comprising a movable element for movement in performance of exercise by a user.” Studor teaches that its exercise system 10 includes exercise equipment 12 (“exercise mechanism”) in the form of a bicycle with pedals (“movable element”) for the user to move in performance of an exercise routine:

The exercise equipment 12 allows the user to interact directly during exercise with the simulated environment created by the other components of the exercise system 10. The nature of the specific exercise equipment 12 which is used can vary considerably. FIG. 1 depicts an exercise bicycle being used, but treadmills, stairsteppers, rowing machines, ski machines, and other equipment are equally suitable. **The exercise equipment 12 includes, as a minimum, an adjustable resistance system 22 and a speed sensor 24 (FIG. 2).** The user may set a nominal difficulty level for exercise by adjusting the resistance system 22, then, as the exercise equipment 12 is operated, the speed sensor 24 provides data from which the user's actual efforts can be inferred.

Ex. 1005, 4:38-51.

74. A POSITA would have recognized that exercise equipment like a bicycle, treadmill, stairstepper, or rowing machine that includes sensors and a resistance system would have include various types of movable elements like movable pedals for the bicycle, a movable tread for the treadmill, movable stairs or the like for the stairstepper, and movable paddles for the rowing machine.



Ex. 1005, Fig. 1 (annotated)

75. **Second**, Studor teaches “*the exercise mechanism having one or more operating parameters.*” Exercise equipment 12 has multiple operating parameters evidenced by the inclusion of speed sensors 24 for detecting user activity and resistance systems 22 for setting and providing feedback to a user:

Various exercise equipment 12 on the market today comes with any of several suitable configurations of both speed sensors 24 and resistance systems 22. Alternately, such may easily be retrofitted to many types of existing exercise equipment 12. Some commonly available speed sensors 24 include reductor, hall-effect, tachometer, and pulse creating alternator type devises. **Some commonly used resistance systems 22 are friction and magnetic braking devices (e.g., electronically adjustable brakes using a motor or electromagnet system, and even brakes powered from**

an alternator used in the speed sensor 24). These are typically controlled by motor-driven actuators, and many are able to provide feedback indicating the current brake setting.

Ex. 1005, 4:52-64, *see also* 4:47-49 (“The user may set a nominal difficulty level for exercise by adjusting the resistance system 22”).

76. Thus, Studor’s exercise equipment 12 that includes movable components for the user to conduct exercise and sensors and a resistance system discloses “*an exercise mechanism comprising a movable element for movement in performance of exercise by a user, the exercise mechanism having one or more operating parameters*” as recited in the claims.

[1.2] (b) interface means, communicating with the exercise mechanism, for gathering a first signal from the user;

[29.2] (b) at least one user interface device, communicating with the exercise mechanism, the at least one interface device gathering a first signal from the user;

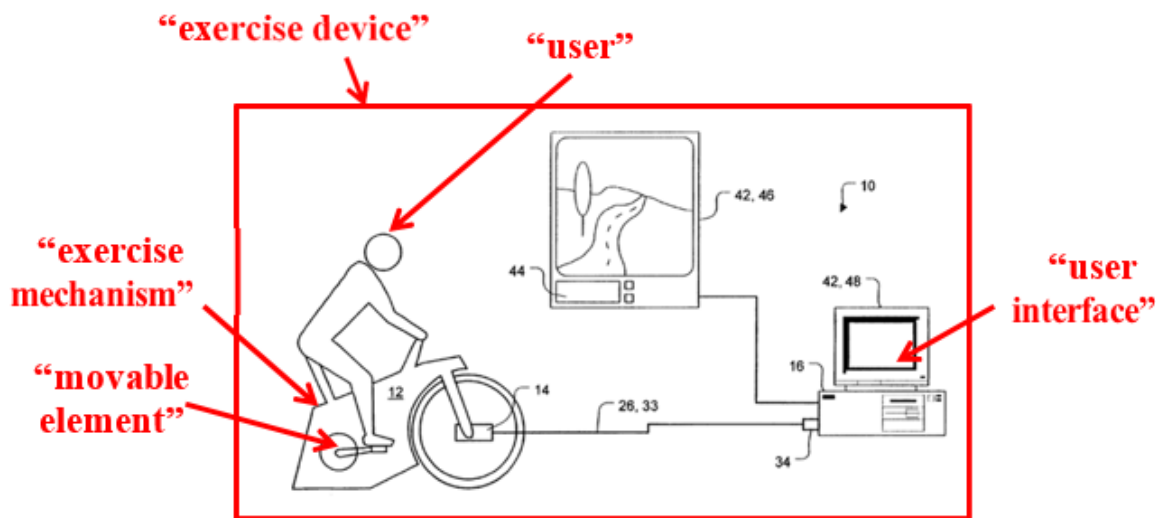
77. First, Studor teaches that its exercise system includes a computer system 16 that has a user interface, and optionally, user input devices integrated in exercise equipment 12 in the form of a keypad and display unit 72 (“*user interface device*”/“*interface means*”). Studor explains that computer system 16 includes a user interface for user interactivity:

Returning to FIG. 1, **the computer system 16 provides a user interface**, operating platform, and processing for the software

program 18 (FIGS. 3 and 4). **It affords users interactivity** to control audio- video environments assembled and played from the data contained on the media 20, and **it may provide difficulty feedback and other status information to the user (if such is not provided by a display system at the exercise equipment 12, or the computer system 16 may even provide redundant difficulty feedback)**. The computer system 16 may be a suitably featured personal computer (PC), or other platform, which includes a media player 36, an audio sub-system 38, a video sub-system 40, and a monitor 42.

Ex. 1005, 6:3-15.

78. Computer system 16, which includes a user interface for interacting with the exercise system 10 is shown in Fig. 1 below:



Ex. 1005, Fig. 1 (annotated)

79. In some implementations, “users located on different continents may employ exercise system 10 with Internet connected network computers (NC) and

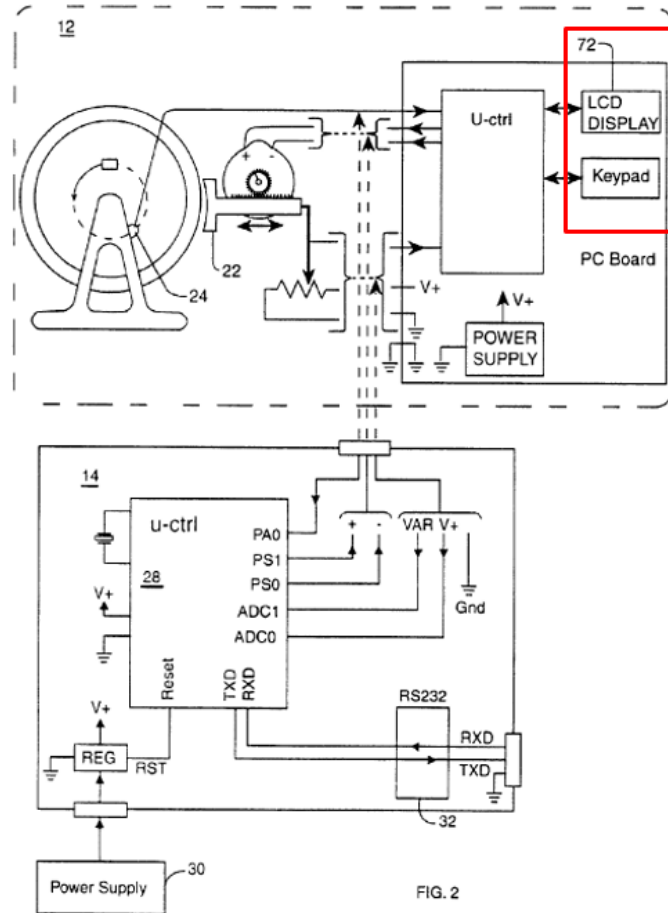
media 20 on a server computer.” Ex. 1005, 8:31-35. In such implementations, a POSITA would understand a local network computer would include the user interface to enable the local network computer to gather user input for exercise equipment 12.

80. Studor further explains that the exercise equipment 12 can optionally include integrated user interface devices, such as a keypad and display unit 72:

The user is also asked to specify a desired nominal level of difficulty at which they would like to exercise (*e.g.*, easy, realistic, hard), the type and parameters of audio output desired (*e.g.*, volume, music or nature sounds, etc.), and what feedback information they would like to additionally see while exercising (*e.g.*, pulse, speed, distance, calories, etc.). This information as feedback can be displayed on the monitor 42 (*e.g.*, superimposed upon the video playback), **on a display unit 72 (FIG. 2) incorporated into the exercise equipment 12**, or even on another separate display device.

Ex. 1005, 12:30-40.

81. The user interface devices optionally integrated into exercise equipment 12 is shown in Fig. 2 below:



Ex. 1005, Fig. 2 (annotated)

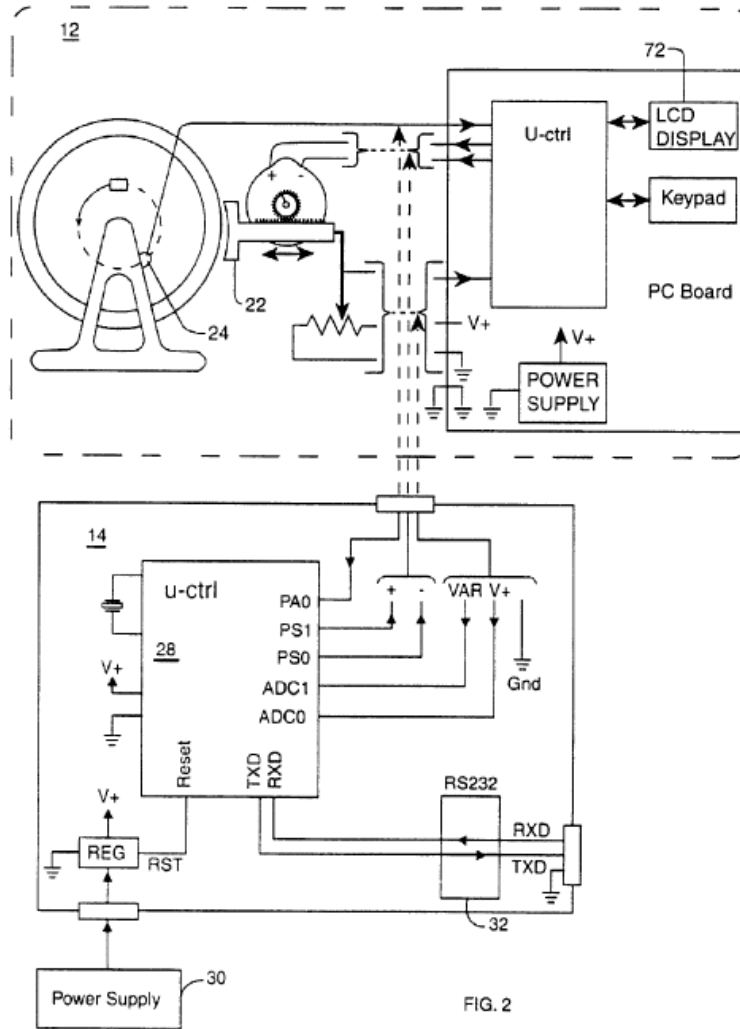
82. **Second**, the user interface on a local network computer in computer system 16, and optionally, keypad and display unit 72 integrated in exercise equipment 12 also facilitates “*communication with*” the exercise mechanism. The user interface on a network computer in computer system 16 allows the user to control operating parameters like resistance levels via software 18.

The M-S converter 14 includes circuitry to drive commonly used resistance systems 22, and to receive information from commonly used speed sensors 24 (some examples of both have been noted

above). The M-S converter 14 also includes circuitry to perform signal-conditioning and to **communicate with the computer system 16, via the communications link 26**. In the preferred embodiment (*see e.g.*, FIG. 2), the M-S converter 14 includes a micro controller 28 (*e.g.*, a Motorola® MC68HC11) With integrated analog-to-digital capability, internal **data communication** capability, and sufficient memory for its role. A suitable external power supply 30 is chosen to meet the demands from the hardware of the M-S converter 14, as is circuitry to condition the signals coming from and going to the exercise equipment 12. A RS- 232 Receiver/Transmitter integrated circuit (IC) communications port 32 interfaces the micro controller 28 to the communications link 26, and in turn to the computer system 16.

Ex. 1005, 5:15-32.

83. Further, a POSITA would understand from Figure 2, that the keypad and display unit 72 is also in communication with the exercise mechanism through the micro controller on the PC board as shown below.



Ex. 1005, Fig. 2

84. As mentioned above at Section VII.B (construction for “*communicating means*” / “*communicating mechanism*”), the specification of the ’062 Patent provides an explicit definition for the term *communicating with*: “any type of applicable communication known to one skilled in the art in light of the disclosure herein, such as electrical communication, optical communication, physical communication, magnetic communication, software communication,

hardware communication, data communication, and the like.” Even if this definition is read into the claims, Studor teaches it because the user interface on computer 16 communicates with the exercise equipment 12 (“*exercise mechanism*”) through at least data communication. *See* Ex. 1005, 5:15-32 (describing “internal data communication capability” and other circuitry in M-S converter 14).

85. **Third**, the user interface devices receive a first signal from the user in that it receives input from the user to set up exercise sessions.

To facilitate ease of use of the exercise system 10 for setting-up exercise sessions, for interactively controlling them, and for later summarizing and comparing session statistics, existing user familiarity with conventional computer graphical user interfaces (GUI) may be used to great advantage (and for users lacking such experience, there is a wide range of training resources for such GUI)... **Such GUI and appropriate options in the software program 18 can thus allow users the flexibility to select what they want to display if anything**. And, data acquisition of exercise data with third party evaluation programs, exercise journal software, internet/modem racing, and other features may be provided in enhanced embodiments of the exercise system 10.

Ex. 1005, 6:25-48; *see also* 9:34-43, 9:54-10:32 (describing data on media 20 to control exercise equipment 12), 11:5-15 (“transmits control data through the

communications link 26 to the M-S converter 14 for the dynamic control of the resistance system 22.”), 12:23-44 (discussing exercise session setup procedures).

86. Accordingly, because Studor teaches that software 18 uses the data in media 20 to simulate terrain changes in a given course, and that terrain data is simulated to the user of the exercise equipment, a POSITA would have understood that such a feature would include the user interface “communicating with the exercise mechanism” to “gather[] a first signal from the user” so that the user could select a desired course or control the exercise device during the exercise routine.

87. Thus, Studor’s teaching of a user interface on computer 16 and optionally user interface devices integrated in exercise equipment 12 that controls software implementing data that include terrain information to simulate the course to the user discloses “*at least one user interface device, communicating with the exercise mechanism, the at least one interface device gathering a first signal from the user*” as recited in the claims.

[1.3] (c) communicating means, communicating with the interface means, for receiving a packetized second signal from a remote source over a network, the packetized second signal including one or more packetized control signals; and

[29.3] (c) a communicating mechanism, communicating with the user interface device, the communicating mechanism receiving a packetized second signal from a remote source over a network, the packetized second signal including one or more packetized control signals; and

88. **First**, Studor teaches that computer system 16 in the exercise system can receive media 20 over a network like the Internet so that multiple users can participate in the same exercise course:

Emerging technology is continually remolding the definition of what is a computer system, and the present exercise system 10 is quite able to employ such evolving technology to advantage. It should particularly be noted that not all components of the computer system 16 need to be physically present in one “box,” or even at one location. **Computer networking, and particularly the Internet, are today broadening computer capabilities considerably. The exercise system 10 may also use such technology. For example, users located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold “communal” exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.**

Ex. 1005, 8:23-37, *see also* 16:53-62 (“A key point of consumer interest for the exercise system 10 is the variety possible in the media 20. Users of the invention could, via simulation, bicycle the Pacific Coast highway in California one day, and trek in the Pyrenees mountains of northern Spain the next. **The media 20 of different course profiles could be distributed by video rental companies, transferred from a proprietary health club video server on a network,**

obtained via the Internet using an interactive television, or even transmitted using digital satellite.”).

89. A POSITA would have recognized that because computer system 16 can communicate over a network such as the Internet, that it has a network interface (“*communicating mechanism*”/“*communicating means*”). Furthermore, a POSITA would have understood that the network interface of local network computer in computer system 16 would be “communicating with” the user interface of computer 16 to allow a user to interact with the server-based media over the network the same as if the media was stored on the device. The specification of the ’062 Patent provides a definition of *communicating with*: “any type of applicable communication known to one skilled in the art in light of the disclosure herein, such as electrical communication, optical communication, physical communication, magnetic communication, software communication, hardware communication, data communication, and the like.” Even if this definition is read into the claims, a POSITA would have recognized that a network interface of computer 16 would communicate with the user interface through at least software communication or data communication. *See* Ex. 1005, 5:21-24 (describing “internal data communication capability”).

90. **Second**, Studor teaches receiving control signals in the form of terrain characteristic data: “The media 20 used with the exercise system 10 are produced

by acquiring position and terrain characteristics for real-world courses for the table files 56.” Ex. 1005, 9:54-56.

91. The terrain characteristic data are control signals because they are used to determine the resistance level: “[T]he M-S converter 14 is able to **controllably adjust** the resistance system 22 on the exercise equipment 12 as a function of the speed data received and the parameters contained in course information (*i.e.*, **terrain characteristics**; *see e.g.*, FIGS. 7 and 8) which are stored on the media 20.” Ex. 1005, 11:38-42, 12:48-50 (describing how terrain characteristics data is captured and used to control exercise equipment 12), 4:6-10 (“FIG. 5 is a graph illustrating relationships between the resistance range of the exercise system and typical course sequences, one where slope is a varying terrain characteristic.”).

92. Notably, Studor repeatedly emphasizes that the terrain characteristics data provides the “appropriate control for the resistance system 22.” Ex. 1005, 13:18-25 (“In response to **the terrain characteristic information**, a resistance is calculated and transmitted to the M-S converter 14, which provides **appropriate control** for the resistance system 22 of the exercise equipment 12.”), 13:22-25 (“[T]he terrain characteristic data representing the actual terrain of the real-world course being viewed is used to **automatically further vary settings** of the resistance system 22, thereby applying a dynamic difficulty level.”); *see also* Ex.

1005, 11:11-12 (“transmits **control data** through the communication link 26 to the M-S converter 14 **for dynamic control** of the resistance system 22, to correlate a user’s performance on the exercise equipment 12 with the rate and manner in which contents of the media 20 are being played”).

93. **Third**, a POSITA also would have understood that because the media 20, which includes terrain characteristic data (*i.e.*, control signals), is delivered via the Internet, which is a packet-based networking system, the computer system 16 would be receiving packetized control signals from the media 20 located on the server. *See* Ex. 1005, 8:29-37. Said differently, the media 20 that controls exercise equipment 12, and is received over the Internet in a packetized form, is a “packetized control signal” as claimed. *See also* Section V (state of the art). As discussed above in Limitations [1.2]/[29.2], the media 20 includes software 18 and data representing real-world terrain from various courses. *See* Ex. 1005, 9:34-43 (“The media 20 may also contain software program 18, for loading into and execution on the computer system 16” and the software program 18 can be downloaded from an Internet site.).

94. Given the Internet-based implementation described above, a POSITA would have recognized that terrain data stored in media 20 located on a server would be received by the computer system via the network interface and would then be used to control various aspects of the exercise equipment like the resistance

so that the user would experience the simulated terrain. Based on this, a POSITA thus would have understood that the packetized signals from the server delivering the media 20 would include packetized control signals as the terrain data, which is used to control the resistance, is delivered from the server and interpreted and applied to the system. Ex. 1005, 12:45-65 (“FIG. 5 depicts how an interactive difficulty function in the preferred embodiment works. The possible range of resistance settings of the exercise equipment 12 is mapped to a linear integer equipment range 74 between 0 and 100. The range of terrain characteristics for a course is then normalized and mapped into this equipment range 74. For each course, the table files 56 (FIG. 3) in the media 20 are used to create a lookup table 76 (FIG. 7) of sub-ranges 78 which correlate normalized terrain characteristic values with the relative time that the characteristic value was collected. A simple multiplier is then used to determine the extent of the sub-range 78 of the normalized characteristic data within the full dynamic equipment range 74 of the exercise equipment 12. This multiplier is determined empirically by matching the resistance of the exercise equipment 12 to the resistance of the simulated in situ exercise. **Calibration of actual terrain characteristics with settings of the particular resistance system 22 used is common to all media 20, although the range and time progression of characteristics of course vary depending upon the unique terrain represented within each course.**”), 13:18-25 (“In response to the terrain

characteristic information, a resistance is calculated and transmitted to the M-S converter 14, which provides appropriate control for the resistance system 22 of the exercise equipment 12. In this manner, **the terrain characteristic data representing the actual terrain of the real-world course being viewed is used to automatically further vary settings of the resistance system 22, thereby applying a dynamic difficulty level.**”), 10:16-23 (“Further, **terrain characteristics which may not easily be simulated directly (e.g., altitude or temperature variation) may nonetheless be recorded in the data files 50, and the software program 18 may be used to control the exercise equipment 12 a suitable manner to apply a variable ‘handicap’** (or more preferably termed, an ‘indirect feedback’) which simulates the varying effort levels required of users on such a real world course.”).

95. Furthermore, the specification of the ’062 Patent provides a definition of *packetized*: “data that has been manipulated into one or more packets according to a packet switching protocol for transmission via network 16, such as may be understood in light of the following teaching and knowledge within the art.” Ex. 1001, 16:42-47. Whether this definition is read into the claims, Studor teaches it because it teaches receiving control signals over the Internet. And, as mentioned above, a POSITA would have recognized that the Internet is a packet-switched network that transmits data using packets.

96. Moreover, to the extent that the claim term “packetized second signal from a remote source over a network” excludes pre-downloaded control signals, Studor renders this obvious as well. In addition to using terrain data received over the Internet, Studor teaches that “users located on different continents may ... **hold ‘communal’ exercise sessions in concert**, for competitive sporting events, or for coached exercise regimes.” Ex. 1005, 8:32-38. To hold a live exercise session in concert, a POSITA would have found it obvious to use some mechanism, such as a synchronization control signal, to synchronize the exercise devices in different continents. *See e.g.*, Ex. 1008 (Bobick), Fig. 23; 25:60-26:32 (describing using signals for “synchronizing each of the exercise apparatus in a network”). Such mechanism in a live session, along with the terrain data, renders obvious a packetized signal from a remote source over a network.

97. Studor also teaches that the “audio sub-system 38” and “video sub-system 40” each includes subsystems to reproduce the corresponding audio and video signals contained within media 20. Ex. 1005, 7:1-20. This would require a synchronization mechanism to correlate the terrain data or live session data.

98. Thus, Studor’s teaching of the exercise system using the Internet to both download media 20 and to participate in network-based exercise routines with other users renders obvious “*a communicating mechanism, communicating with the user interface device, the communicating mechanism receiving a packetized*

second signal from a remote source over a network, the packetized second signal including one or more packetized control signals” as recited in the claim.

[1.4] (d) means, responsive to the packetized second signal, for controlling the operating parameters of the exercise mechanism.

[29.4] (d) a controller, responsive to the packetized second signal, configured to control the operating parameters of the exercise mechanism.

99. Studor’s micro controller 28 in M-S converter 14 (“*means for controlling*” / “*controller*”) responds to the terrain characteristics data and synchronization information (“*packetized second signals*”) by controlling resistance of exercise equipment 12 (“*operating parameters of the exercise mechanism*”).

100. Studor teaches that computer system 16 processes the media 20 received on the Internet and thus would be responsive to the packetized data when including a network interface connected to the Internet:

Emerging technology is continually remolding the definition of what is a computer system, and the present exercise system 10 is quite able to employ such evolving technology to advantage. **It should particularly be noted that not all components of the computer system 16 need to be physically present in one “box,” or even at one location. Computer networking, and particularly the Internet, are today broadening computer capabilities considerably. The exercise system 10 may also use such technology. For example, users located on different continents**

may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold “communal” exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.

Ex. 1005, 8:23-37.

101. Data included in media 20 can then be processed by the software 18 operating on computer system 16 to control the exercise equipment including setting the resistance:

The software program 18 (FIG. 3) is used to perform the three conventional tasks of input, output and processing. It accepts as input the data files 50 from the media 20, and also speed sensor 24 (an optional other sensors) data from the M-S converter 14 as it arrives via the communications link 26. As output it plays back the video files 52 and the audio files 54 from the media 20 and it transmits control data through the communications link 26 to the M-S converter 14 for dynamic control of the resistance system 22, to correlate a user’s performance on the exercise equipment 12 with the rate and manner in which contents of the media 20 are being played.

Ex. 1005, 11:5-16.

In response to the terrain characteristic information, a resistance is calculated and transmitted to the M-S converter 14, which provides

appropriate control for resistance system 22, of the exercise equipment 12.

Ex. 1005, 13:18-21; *see also* 10:16-23 (“Further, **terrain characteristics** which may not easily be simulated directly (*e.g.*, altitude or temperature variation) may nonetheless be recorded in the data files 50, **and the software program 18 may be used to control the exercise equipment 12 a suitable manner to apply a variable ‘handicap’** (or more preferably termed, an ‘indirect feedback’) which simulates the varying effort levels required of users on such a real world course.”), 11:22-26 (“The terrain data corresponding to the current ‘position’ in the exercise course is then fetched and processed and the process adjusts the video playback rate to synchronize the video position with the virtual position of the user within the exercise course.”).

102. M-S converter 14 performs two major tasks: “One is to receive commands from the computer system 16 to control the resistance system 22 of the exercise equipment 12, and the other is to acquire data from the speed sensor 24 of the exercise equipment 12, to convert that data as needed, and to then transmit it through a communications link 16 to the computer system 16.” Ex. 1005, 5:4-9.

103. To perform those tasks, M-S converter 14 includes a computer, specifically micro controller 28:

The M-S converter 14 also includes circuitry to perform signal-conditioning and to communication with the computer system 16, via the communications link 26. In the preferred embodiment (*see e.g.*, FIG. 2), the M-S converter 14 includes a **micro controller 28** (*e.g.*, a Motorola® MC68HC11) with integrated analog-to-digital capability, internal data communication capability, and sufficient memory for its role.

Ex. 1005, 5:18-24.

104. Based on these teachings of receiving media 20 from a server via the Internet, a POSITA would have understood that packetized control signals like the terrain data would have been received by the computer system 16 and then processed by software 18 to send to micro controller 28 in M-S converter 14 to control the resistance parameters on the exercise equipment.

105. Thus, Studor's computer system 16 receives packetized data from a server via the Internet that is then used to control the exercise equipment, which renders obvious "*a controller, responsive to the packetized second signal, configured to control the operating parameters of the exercise mechanism*" as recited in the claims.

* * *

106. Given the above, Claims 1 and 29 are obvious over Studor.

C. Claims Dependent on Claims 1 and 29

1. Claim 3

[3] An exercise device as recited in claim 1, wherein the packetized second signal comprises a signal selected from the group consisting of an audio signal, a visual signal, and a control signal.

107. Studor renders obvious that the media 20 (“*packetized second signal*”) comprises a signal selected from the group consisting of “natural sound content ... or ... verbal feedback and encouragement, or for music to set a mood or to entertain” (“*an audio signal*”), “true nature video content” (“*a visual signal*”), and “terrain characteristic data control signal” (“*a control signal*”).

108. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 12-13. I have been instructed by counsel to interpret “consisting of” the same way.

109. As explained above with respect to Studor’s disclosure of limitations [1.3]/[29.3], the “media 20” is a packetized second signal. Ex. 1005, 9:54-56 (“The ***media 20*** used with the exercise system 10 are produced by acquiring position and terrain characteristics for real-world courses for the table files 56.”).

110. Studor’s media 20 includes “a visual signal.” Studor teaches that “[t]rue nature video content is used, which is captured in natural settings along real world courses, rather than computer animation and graphics, or such superimposed upon nature still scenes.” Ex. 1005, 3:32-35. As depicted in Figure 1 and explained

by Studor, the video sub-system 40 displays the video data stored in media 20 to the user:

The video sub-system 40 reproduces video data stored in the media 20, and outputs either or both of television (TV) type video or SVGA signals to the monitor 42 used by the exercise system 10.

Users view the playback of video data on a monitor 42 (*e.g.*, color television 46, TV goggles (not shown), or a computer monitor 48) which has suitable resolution and refresh rate to provide crisp viewing of video presentation.

Ex. 1005, 7:13-20.

111. Studor's media 20 also includes an "audio signal." Studor teaches that "[t]he user may optionally select that natural sound content be added to the experience, or may opt for verbal feedback and encouragement, or for music to set a mood or to entertain." Ex. 1005, 3:36-38. Similar to Studor's disclosure of the video signal, Studor explains that "[t]he audio sub-system 38 of the computer system reproduced the audio data stored in the media 20." Ex. 1005, 7:1-2. Studor further explains that "[m]ultiple types of audio files 54 may be provided," including "voice audio files 58 (*e.g.*, currently popular Spinning Workouts at health clubs" and "music audio files 60." Ex. 1005, 9:14-20.

112. Furthermore and as I explained above with respect to Limitations [1.3]/[29.3], Studor teaches the packetized second signal in the form of a control

signal. Ex. 1005, 9:54-56 (“The media 20 used with the exercise system 10 are produced by acquiring position and terrain characteristics for real-world courses for the table files 56.”).

113. The terrain characteristic data are control signals because they are used to determine the resistance level: “the M-S converter 14 is able to controllably adjust the resistance system 22 on the exercise equipment 12 as a function of the speed data received and the parameters contained in course information (*i.e.*, terrain characteristics; *see e.g.*, FIGS. 7 and 8) which are stored on the media 20.” Ex. 1005, 11:38-42.

114. A POSITA also would have understood that because the media 20, which includes terrain characteristic data (*i.e.*, control signals), is delivered via the Internet, which is a packet-based networking system, the computer system 16 would be receiving packetized control signals from the media 20 located on the server. *See* Ex. 1005, 8:29-37. Said differently, the media 20 that controls the treadmill, and is received over the Internet in a packetized form, is a “packetized control signal” as claimed. As discussed above in Limitations [1.2]/[29.2], the media 20 includes software 18 and data representing real-world terrain from various courses. *See* Ex. 1005, 9:34-43 (“The media 20 may also contain software program 18, for loading into and execution on the computer system 16” and the software program 18 can be downloaded from an Internet site.).

115. To the extent “consisting of” is a so-called “closed group,” Studor renders this limitation obvious. It would have been obvious for Studor’s second signal to be selected from the group containing only an audio, visual, and control signal. A POSITA would have understood that these three signal types were one of only a few possible design choices that would have been obvious to try.

116. Thus, Studor renders obvious “*the packetized second signal comprises a signal selected from the group consisting of an audio signal, a visual signal, and a control signal*” as recited in the claim.

2. Claim 4

[4] An exercise device as recited in claim 1, wherein the control signal is synchronized with at least one of the audio signal and the visual signal.

117. Studor teaches that the control signal is synchronized with at least one of the audio signal and the visual signal. In particular, Studor explains that the terrain characteristics data (*i.e.* the “control signal”) synchronized with the video files 52 (*i.e.* the “visual signal”). “The ***terrain data corresponding to the current ‘position’*** in the exercise course is then fetched and processed and the process adjusts the video playback rate ***to synchronize the video position with the virtual position of the user within the exercise course.***” Ex. 1005, 11:22-26. Studor further explains how the speed and slope information derived from the terrain characteristics data is synchronized with the digital video:

One method used by the inventors to concurrently collect slope terrain data and video data for cycling has been to record the known overall distance of a course; record the video in real-time using a firewire connection between the video camera and a PC logging the data; and varying travel speed in accordance with a normalized data set derived from empirical data collected from the speed of an actual cyclist in accordance with the slope terrain, *i.e.* 6 degree slope=8 MPH and a zero degree slope=20 MPH, etc. **In this manner, speed of travel and slope data can be synchronized (in real-time) with digital video, and concurrently recorded slope time intervals can be made equally divisible with digital or analog video frame per second rates.**

Ex. 1005, 10:15-57; *see also id.*, 9:34-10:2 (“synchronizing information in the media 20”). Studor teaches that “media 20 (FIG. 3) contains three general types of pre-recorded data files 50: video files 52 (*e.g.*, compressed AVI or MOV formats), audio files 52 (*e.g.*, in WAV, MIDI and other formats, and table files 56 of normalized terrain characteristic data (*e.g.*, slope data, **which associate terrain characteristics to particular times in a video files 52.**” Ex. 1005, 8:65-9:3.

118. Thus, Studor discloses “*the control signal is synchronized with at least one of the audio signal and the visual signal*” as recited in the claims.

3. Claim 5

[5] An exercise device as recited in claim 3, wherein a trainer promulgates the control signal.

119. Studor teaches a video, disk, or dynamic or interactive software program (stored “*trainer*”), or a spinmaster or coach (live “*trainer*”) that promulgates the terrain characteristics data (“*control signal*”).

120. I note that Claim 5 does not recite what type of trainer is required. The ’062 Patent discloses that the “trainer” could either be “live” or “stored.” ’062 Patent, 4:10-12. The ’062 Patent further explains that a “live trainer” is a “human being,” while a “stored trainer” can be “e.g., a website, video, disk, or dynamic or interactive software program.” ’062 Patent, 3:65-4:3. Because Claim 5 recites a “trainer” without specifying the type, a POSITA would understand that either a “live” or “stored” trainer would suffice.

121. Studor teaches an exercise device as recited in Claim 3, wherein a trainer promulgates the control signal. In particular, Studor expressly teaches a stored “trainer” in the form of a video, disk, or dynamic or interactive software program that promulgates the terrain characteristic data (*i.e.* “control signal”). Studor’s media 20 includes terrain characteristic data (*i.e.*, control signals), is delivered via the Internet. *See* Ex. 1005, 8:29-37. As discussed above for Limitations [1.2]/[29.2], the media 20 includes software 18 and data representing real-world terrain from various courses. *See* Ex. 1005, 9:34-43 (“The media 20 may also contain software program 18, for loading into and execution on the computer system 16” and the software program 18 can be downloaded from an

Internet site.). Studor also explains that it uses “CD-ROM drive or a DVD drive” for media 20, which includes the terrain characteristic data. Ex. 1005, 6:49-67.

122. Thus, Studor’s disclosure of a trainer that promulgates the control signal is precisely in line with the ’062 Patent’s disclosure of a “stored trainer,” which is within the scope of Claim 5.

123. To the extent Claim 5 is limited to a “live trainer,” Studor expressly teaches using a live trainer, and in particular a live trainer that provides “workout commands.” Ex. 1005, 9:14-20 (“Multiple types of audio files 54 may be provided. Two of these, voice audio files 58 (*e.g.*, currently popular Spinning Workouts at health clubs could be done at home in the natural environment simulation provided by the exercise system 10, with *a spinmaster giving workout commands*) and music audio files 60 are used in generally conventional manners.”); *see also* Ex. 1005, 8:32-38 (“For example, users located on different continents may employ the exercise system 10 with internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold ‘communal’ exercise sessions in concert, for competitive sporting events, or *for coached exercise regimes.*”). A POSITA would have been motivated to and would have known how to utilize Studor’s “spinmaster” to give commands that correspond to a control signal.

124. A POSITA would have been motivated to use a live trainer who promulgates the control signals. First, Studor expressly teaches using a live trainer who provides the user with “workout commands.” Ex. 1005, 9:14-20. A POSITA would have understood that the workout commands could be the terrain characteristics data from a certain course. Second, a POSITA would have recognized the convenience of automating that process, and would have further recognized that Studor’s system already had the communication and processing components necessary to do so, and therefore no additional components or equipment were necessary. Third, implementing a live trainer control signal was well within the capabilities of a POSITA, as demonstrated by Studor’s teachings of using a spinmaster or coach.

125. A POSITA would have recognized the benefits and convenience of automating the live “spinmaster” and “coached ... regimes” taught by Studor to include promulgated control signals, such as the terrain characteristics data. Rutberg Decl. ¶¶ 90-92, 108. A POSITA would have recognized that a live trainer with such capabilities could customize the exercise program for each individual user, based on *a priori* knowledge of that user or the user’s performance in the current program. Rutberg Decl. ¶ 108. (Ex. 1025.) For example, in a multi user session as taught by Studor, a POSITA would recognize that the “users located on different continents” may not have the same physical abilities. *See also* Ex. 1005,

8:44-48. (“For example, a health club might employ the exercise system 10 with one computer system 16 to concurrently control a variety of exercise equipment 12 for its various individual member-users, all in manners suiting their individual tastes and capabilities.”). Therefore it would be advantageous to scale the difficulty level accordingly, which Studor already had the capability to do. Ex. 1005, 12:30-36 (“e.g., easy, realistic, hard”), Fig. 6; Rutberg Decl. ¶¶ 106-108. Providing Studor’s “spinmaster” or “coach” (“live trainer”) the ability to scale the resistance was an obvious extension of Studor’s express capabilities, and was well within the knowledge of a POSITA to implement.

126. Thus, Studor renders obvious “*a trainer promulgates the control signal*” as recited in the claim.

4. Claims 8 and 30

[8] An exercise device as recited in claim 1, wherein the interface means is selected from the group consisting of: (i) one or more audio input devices; and (ii) one or more video output devices.

[30] An exercise device as recited in claim 29, wherein the at least one user interface device is selected from the group consisting of one or more audio input devices and one or more video input devices.

127. Studor renders obvious that the user interface in computer system 16 (“*the at least one user interface device*”) is selected from the group consisting of video conferencing devices (“*audio input devices,*” “*video input devices,*” and “*video output devices*”).

128. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 14-16, 31-32. I have been instructed by counsel to interpret “consisting of” the same way.

129. With respect to the “*video output devices*,” Studor expressly states that computer system 16 includes “video sub-system 40” which includes a “monitor 42” and “display unit 72” (“one or more video output devices”). Ex. 1005, 7:1-20, 12:23-44; Fig. 2. Studor explains that “information as feedback can be displayed on the monitor unit 72” or alternatively, “on a display unit 72 (FIG. 2) **incorporated into the exercise equipment 12.**” Ex. 1005, 12:36-39. Both the “monitor 42” and “display unit 72” are part of Studor’s “interface means [device]” as claimed.

130. Studor explains that computer system 16 may include common video conferencing capability:

Of course, separated multiple users of the exercise system 10 in situations like those described above might want to communicate with and actively perceive each other. **This is possible with realistic audio and even visual communication over networks in the computer system 16, using increasingly common technology (e.g., by incorporating “video conferencing” type capability into the exercise system 10).**

Ex. 1005, 15:47-53.

131. A POSITA would have understood that a system implementing common video conferencing capability would require an audio input device, such as a microphone, and a video input device, such as a camera. Studor confirms that computer system 16 could include a camera to record video in real-time for recording other activities, such as over the distance of a course:

One method used by the inventors to concurrently collect slope terrain data and video data for cycling has been to record the known overall distance of a course; record the video in real-time using a firewire connection between the video camera and a PC logging the data; and varying travel speed in accordance with a normalized data set derived from empirical data collected from the speed of an actual cyclist in accordance with the slope terrain, *i.e.* 6 degree slope=8 MPH and a zero degree slope=20 MPH, etc. In this manner, speed of travel and slope data can be synchronized (in real-time) with digital video, and concurrently recorded slope time intervals can be made equally divisible with digital or analog video frame per second rates.

Ex. 1005, 10:15-57.

132. The inclusion of audio and video input devices to implement the video conferencing capability discussed in Studor was well within the knowledge of a POSITA at the relevant time. For example, U.S. Patent No. 6,430,997 (“French”) described using “cameras or other image capturing devices” to capture images of an exerciser so that an image analysis can be performed. Ex. 1015, 10:46-53.

Similarly, U.S. Patent No. 5,785,630 (“Bobick”) explained that “a microphone can be electrically coupled to the computer and located in/on the computer, in/on the display(s), or elsewhere on the exercise machine” to “allow for both voice and data communication between the users.” Ex. 1008, 15:4-11.

133. To the extent “consisting of” is a so-called “closed group,” Studor renders this limitation obvious. It would have been obvious for a POSITA to try a user interface containing only an audio input device and a video output device. It also would have been obvious to try a user interface with only an audio input device and a video input device. Components such as microphones, cameras, and display screens were well known components and each one of only a few design choices for a user interface, and were well within a POSITA’s knowledge.

134. Thus, Studor renders obvious these limitations.

5. Claim 9

[9] An exercise device as recited in claim 1, wherein the interface means comprises one or more controllers.

135. Studor discloses that the user interface on the local computer in computer 16, as well as optionally, input/output devices on exercise device such as a keyboard and display.

136. The ’062 Patent describes the controllers of the interface means as buttons, switches and other input devices:

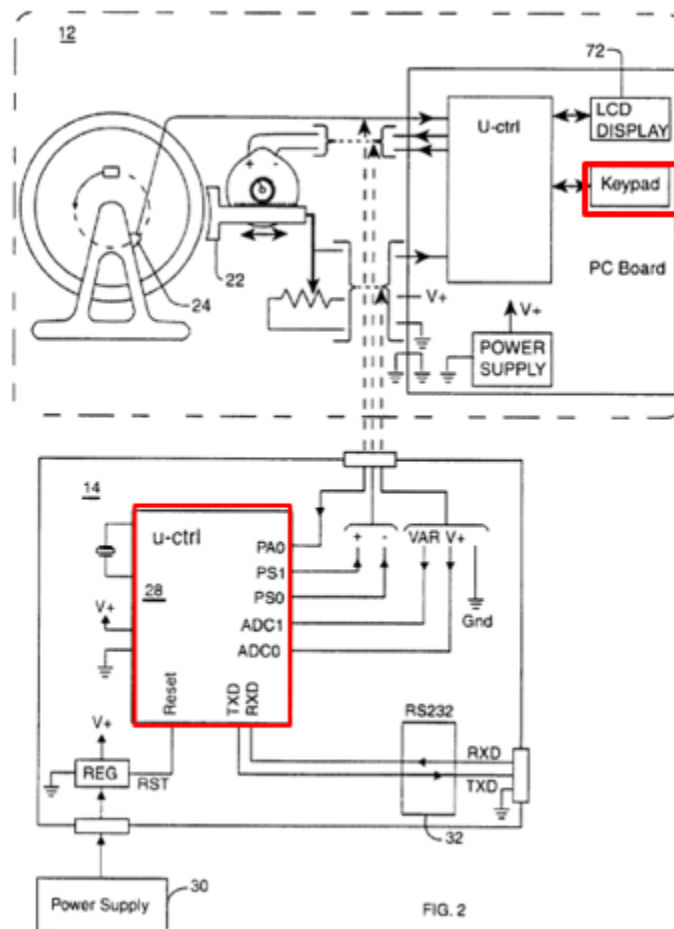
Control panel 22, in one embodiment, as shown in FIG. 6, includes one or more interface devices. Such interface devices may be either input devices or output devices. Input devices enable a user to input and vary the operating parameters of treadmill 12. As examples of such input devices, control panel 22 includes many typical controllers for use on an exercise device, such as a treadmill. A number of illustrative input devices include but are not limited to speed controls 68, incline controls 70, time controls 72, distance controls 74, a start button 76, a stop or pause button 78, and heart rate controls 80. In addition to **these input devices, such as one or more controllers, control panel 22 further optionally includes an iFit.com button 82, a manual override button 84, and a scaling control 86, each of which are also examples of input devices.** It may be appreciated that each of the above-recited controllers or buttons may be embodied in a variety of different manners to perform their commonly utilized function. In addition, each controller, button, and the like may take the form of one or more switches, rheostats, potentiometers, touch sensitive controls, voice activated controllers, and the like. The input devices described herein are examples of structures capable of performing the function of interface means for gathering a first signal (such as a real time signal) from the user.

Ex. 1005, 9:15-36.

137. Studor teaches the interface means comprises one or more controllers. Studor teaches using a keypad that communicates with micro controller 28 in M-S converter (“*controller*”):

The M-S converter 14 also includes circuitry to perform signal-conditioning and to communication with the computer system 16, via the communications link 26. In the preferred embodiment (*see e.g.*, FIG. 2), the M-S converter 14 includes a **micro controller 28** (e.g., a Motorola® MC68HC11) with integrated analog-to-digital capability, internal data communication capability, and sufficient memory for its role.

Ex. 1005, 5:18-24, Fig. 2. A POSITA would understand that the keypad as an input device.



Ex. 1005, Fig. 2 (annotated)

138. Thus, Studor discloses “*the interface means comprises one or more controllers*” as recited in Claim 9.

6. Claim 10

[10] An exercise device as recited in claim 1, wherein the interface means comprises a video camera integrally formed with the exercise device.

139. Studor renders obvious that the user interface in computer system 16 (“*the interface means*”) comprises *a video camera integrally formed with the exercise device.*”

140. Studor expressly teaches integrating video devices into the exercise equipment 12 (“*exercise device*”). Studor explains that “information as feedback can be displayed on the monitor unit 72” or alternatively, “on a display 72 (FIG. 2) **incorporated into the exercise equipment 12.**” Ex. 1005, 12:36-39. Studor further explains “multiple users of the exercise system 10 ... may want to communicate with and actively perceive each other” by “using increasingly common technology (e.g. by incorporating ‘video conferencing’ type capability in the exercise system 10).” Ex. 1005, 15:46-53. Although Studor does not explicitly disclose a video camera integrally formed with the exercise equipment 12 (“*exercise device*”), this was a known option and a natural extension of Studor’s

teachings to incorporate video devices into the exercise equipment 12 and to use “increasingly common” video conferencing technology.

141. A POSITA would have understood that a system implementing common video conferencing capability would require an audio input device, such as a microphone, and a video input device, such as a camera. In another context (capturing terrain data), Studor confirms that a camera can be used to record video in real-time:

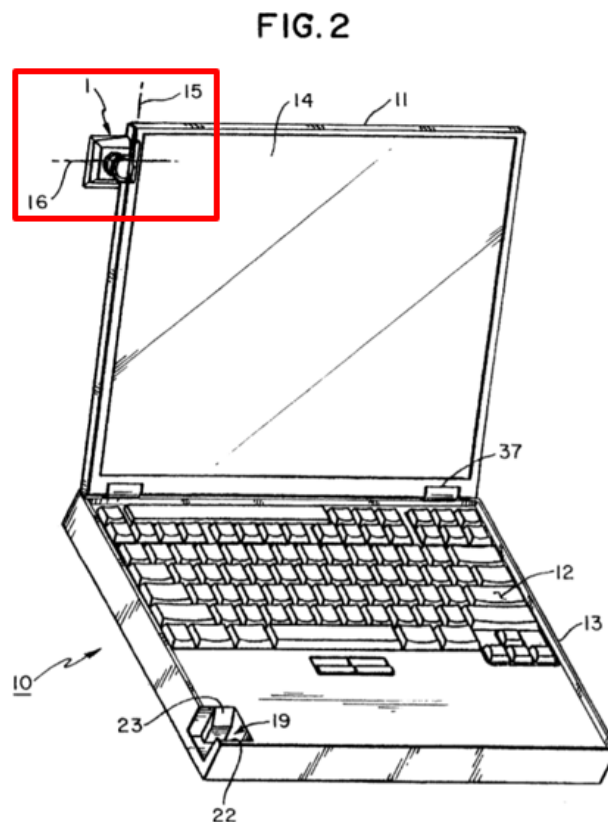
One method used by the inventors to concurrently collect slope terrain data and video data for cycling has been to record the known overall distance of a course; record the video in real-time using a firewire connection between the video camera and a PC logging the data; and varying travel speed in accordance with a normalized data set derived from empirical data collected from the speed of an actual cyclist in accordance with the slope terrain, *i.e.* 6 degree slope=8 MPH and a zero degree slope=20 MPH, etc. In this manner, speed of travel and slope data can be synchronized (in real-time) with digital video, and concurrently recorded slope time intervals can be made equally divisible with digital or analog video frame per second rates.

Ex. 1005, 10:15-57.

142. The inclusion of audio and video input devices to implement the video conferencing capability discussed in Studor was well within the knowledge of a

POSITA at the relevant time. For example, U.S. Patent No. 5,785,630 (“Bobick”) explained that “a microphone can be electrically coupled to the computer and located in/on the computer, in/on the display(s), or elsewhere on the exercise machine” to “allow for both voice and data communication between the users.” Ex. 1008, 15:4-11. Similarly, U.S. Patent No. 6,430,997 (“French”) described using “cameras or other image capturing devices” to capture images of an exerciser so that an image analysis can be performed. Ex. 1015, 10:46-53.

143. Moreover, integrating a video camera into a video display, particularly for video conferencing, was known in the art. U.S. Patent No. 6,587,151 (“Cipolla”) teaches integrating a video camera 16 into a laptop computer screen. Ex. 1018, title (“Video camera integration on a portable computer”). As Cipolla explains, “[t]he invention relates to incorporating a video camera as an integrated feature of a portable computer, and in particular to the structural considerations in integrating a video camera for use and storage in a portable computer.” Ex. 1018, 1:6-10. In Cipolla’s Figure 2 embodiment, “the video camera assembly 1 [is] mounted on the cover 11 near the most extended portion of the periphery of the display 14.” Ex. 1018, 3:29-31:



Ex. 1018, Fig. 2 (annotated). Cipolla recognized that integrating the video camera with the laptop screen would allow “wide camera range and user eye contact [] be made in video conferencing.” Ex. 1018, 1:47-48.

144. Because Studor teaches integrating display unit 72 into exercise equipment 12, a POSITA implementing Studor’s teaching of “using increasingly common” video conferencing technology would have incorporated the video camera into exercise equipment 12 as well. To implement video conferencing capability, a POSITA generally would have only had two options: integrating the video camera with the video display or not integrating the video camera into the

video display. A POSITA would have been motivated to integrate the video camera into the video display because it would provide a better video conferencing experience. In particular, simulating eye contact by integrating the camera into the display (and therefore the exercise equipment 12) furthers Studor's overall goal of simulating real-world experiences.

145. Thus Studor renders obvious "*wherein the interface means comprises a video camera integrally formed with the exercise device*" as recited in Claim 10.

7. Claims 11 and 48

[11] An exercise device as recited in claim 1, wherein the communicating means enables transmission of the first signal.

[48] An exercise device as recited in claim 29, wherein the communicating mechanism enables transmission of the first signal.

146. Studor teaches that the network interface of computer system 16 ("*communicating means*" and "*communicating mechanism*") enables transmission of the input from the user to set up exercise sessions ("*first signal*").

147. As discussed above with respect to Limitations [1.3]/[29.3], a POSITA would have understood that the network interface of computer 16 would be "communicating with" the user interface of computer 16 to allow a user to interact with the server-based media over the network the same as if the media was stored on the device. The specification of the '062 Patent provides a definition of *communicating with*: "any type of applicable communication known to one skilled

in the art in light of the disclosure herein, such as electrical communication, optical communication, physical communication, magnetic communication, software communication, hardware communication, data communication, and the like.” Even if this definition is read into the claims, a POSITA would have recognized that a network interface of computer 16 would communicate with the user interface through at least software communication or data communication. *See* Ex. 1005, 5:24.

148. When a user sets up an exercise session, that input is captured by the user interface:

To facilitate ease of use of the exercise system 10 for setting-up exercise sessions, for interactively controlling them, and for later summarizing and comparing session statistics, existing user familiarity with conventional computer graphical user interfaces (GUI) may be used to great advantage (and for users lacking such experience, there is a wide range of training resources for such GUI)... **Such GUI and appropriate options in the software program 18 can thus allow users the flexibility to select what they want to display if anything.** And, data acquisition of exercise data with third party evaluation programs, exercise journal software, internet/modem racing, and other features may be provided in enhanced embodiments of the exercise system 10.

Ex. 1005, 6:25-48; *see also* 9:34-43, 9:54-10:32, 11:5-15, 12:23-44.

An advantage of the present invention is that very dynamic exercise may be carried out with it, yet without undue user involvement in setting effort levels for the exercise. **A user may, optionally, initially set a nominal difficulty level, and then let the inventive exercise system dynamically control the difficulty thereafter, to present that varying effect of exercising in the changing terrain of a real world exercise course.**

Ex. 1005, 3:23-30.

149. A POSITA would understand that the user interface communicates the input from the user to set up exercise sessions (“*first signal*”) to the network interface of computer system 16 (“*communicating mechanism*”) to send to M-S converter 14 through communication link 26:

The communications link 26 is bi-directional for communications between the computer system 16 and the M-S converter 14. In the preferred embodiment, the communications link 26 utilizes a cable 33 which is suitably terminated with appropriate connectors at both of its ends to connect to the M-S converter 14 and the computer system 16.

Ex. 1005, 5:33-39.

150. A network interface prepares data to be transmitted over the network. Just like a letter must be put in an envelope with an address to enable transmission by mail, the network interface ensures that the data is properly packaged and addressed. In Studor, the network interface of computer system 16 would enable

transmission of the user input by preparing it to be transmitted over communication link 26.

151. Thus, Studor discloses “*wherein the communicating mechanism [or communicating means] enables transmission of the first signal*” as recited in the claims.

8. Claim 15

[15] An exercise device as recited in claim 1, wherein the communicating means communicates with a communication system that is configured to generate one or more second signals.

152. As I explained above with respect to limitations [1.3]/[29.3], a POSITA would have recognized that because Studor’s computer 16 can communicate over a network such as the Internet, that it has a network interface (“*communicating means*”). Furthermore, a POSITA would have understood that the network interface of computer 16 would be “communicating with” the server computer in computer system 16 (“communication system that is configured to generate one or more second signals”). Ex. 1005, 8:32-37 (“Internet connected network computers (NC) and media 20 on a server computer”); *id.*, 8:61-64 (“the media 20 may be stored in a suitable mass storage system, say on a very high capacity hard drive on a network server within the computer system 16.”). And as I also explained with respect to Limitations [1.3]/[29.3], Studor’s media 20 includes the control signals, i.e. “one or more second signals.” Thus, Studor’s

“server” is a “communicating system that is configured to generate one or more second signals.”

153. A POSITA would have understood that to transmit the terrain characteristics data over the Internet to the exercise equipment 12, the server computer hosting media 20 would have to form a connection through the network interface of computer system 16, for example, to packetize the data for transmission over the network.

154. Thus, Studor renders obvious “*wherein the communicating means communicates with a communication system that is configured to generate one or more second signals*” as recited in the claim.

9. Claim 16

[16] An exercise device as recited in claim 15, wherein the communication system comprises memory configured to store the second signal.

155. Studor discloses “*the communication system comprises memory configured to store the second signal.*”

156. Studor’s server (“*communication system*”) includes “a very high capacity hard drive.” Ex. 1005, 5:15-32. A POSITA would recognize that Studor’s server is configured to store the second signal. Studor explains that “media 20 may be stored in a suitable mass storage system.” *Id.* Studor teaches that “media 20 (FIG. 3) contains three general types of pre-recorded data files 50: video files 52

(e.g., compressed AVI or MOV formats), audio files 52 (e.g., in WAV, MIDI and other formats, and table files 56 of normalized terrain characteristic data (e.g., slope data, which associate terrain characteristics to particular times in a video files 52.” Ex. 1005, 8:65-9:3.

157. Thus, Studor discloses “*the communication system comprises memory configured to store the second signal*” as recited in the claim.

10. Claim 21

[21] An exercise device as recited in claim 1, further comprising means for reproducing the second signal.

158. Studor further discloses “*means for reproducing the second signal.*”

159. Studor teaches that once the media 20 is received from the server, M-S converter 14 manipulates the resistance system 22 to reproduce the terrain characteristics using exercise equipment 12. Ex. 1005, 13:18-25 (“In response to the terrain characteristic information, a resistance is calculated and transmitted to the M-S converter 14, which provides appropriate control for the resistance system 22 of the exercise equipment 12.”).

160. Furthermore, Studor expressly states that the “audio sub-system 38” and “video sub-system 40” each “reproduces” the corresponding audio and video signals contained within media 20. Ex. 1005, 7:1-20.

161. Thus, Studor discloses “*means for reproducing the second signal*” as recited in the claim.

11. Claim 22

[22] An exercise device as recited in claim 21, wherein the means for reproducing the second signal comprises one or more audio output devices and one or more video output devices.

162. Studor discloses “*the means for reproducing the second signal comprises one or more audio output device and one or more video output devices.*”

163. As explained above with respect to Claim 21, the computer system 16 reproduces media 20 (“the second signal”) after receiving it from the server. Studor expressly states that “[t]he audio sub-system 38 of the computer system 16 reproduces the audio data stored in the media 20.” Ex. 1005, 7:1-12. Studor further explains that “speaker 44” is for converting the electrical audio signals in media 20 into sounds. *Id.* Therefore, Studor teaches the means for reproducing the second signal comprises one or more audio output devices.

164. Studor also teaches multiple video output devices as part of the means for reproducing the second signal. “The video sub-system 40 reproduces video data stored in the media 20, and outputs either or both of television (TV) type video or SVGA signals to the monitor 42 used by the exercise system 10.” Ex. 1005, 7:13-16. Then, “[u]sers view the playback of vide data on a monitor 42 (e.g., color television 46, TV goggles (not shown), or a computer monitor 48) which has

suitable resolution and refresh rate to provide crisp viewing of video presentation.”

Ex. 1005, 7:16-20.

165. Thus, Studor discloses “*means for reproducing the second signal comprises one or more audio output devices and one or more video output devices*” as recited in the claim.

12. Claim 23

[23] An exercise device as recited in claim 21, wherein the means for reproducing the second signal comprises an output device selected from the group consisting of an audio output device and a video output device.

166. Studor renders obvious “*the means for reproducing the second signal comprises an output device selected from the group consisting of an audio output device and a video output device.*”

167. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 22. I have been instructed by counsel to interpret “consisting of” the same way.

168. As I explained with respect to Claim 22, the means for reproducing the second signal includes both an audio output device and multiple video output devices. Therefore, for the same reasons as above, Studor teaches the means for reproducing the second signal comprises an output device selected from the group consisting of an audio output device and a video output device.

169. To the extent “consisting of” is a so-called “closed group,” Studor renders this limitation obvious. It would have been obvious for a POSITA to try an output device containing only an audio output device and a video output device. It also would have been obvious to try a user interface with a speaker and display screen. Components such as microphones and display screens were well known components and each one of only a few design choices for a user interface, and were well within a POSITA’s knowledge.

170. Thus, Studor renders obvious “*means for reproducing the second signal comprises an output device selected from the group consisting of an audio output device and a video output device*” as recited in the claim.

13. Claim 26

[26] An exercise device as recited in claim 1, wherein the packetized second signal comprises a signal selected from the group consisting of: (i) a packetized control signal; and (ii) a packetized control signal and a signal from a communication system.

171. Studor renders obvious a packetized second signal comprising a signal selected from the group consisting of: (i) a packetized control signal; and (ii) a packetized control signal and a signal from a communication system.

172. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 22-23. I have been instructed by counsel to interpret “consisting of” the same way.

173. As I explained with respect to Limitations [1.3]/[29.3], a POSITA also would have understood that because the media 20, which includes terrain characteristic data (*i.e.*, control signals), is delivered via the Internet, which is a packet-based networking system, the computer system 16 would be receiving packetized control signals from the media 20 located on the server. *See* Ex. 1005, 8:29-37, 9:34-43 (“The media 20 may also contain software program 18, for loading into and execution on the computer system 16” and the software program 18 can be downloaded from an Internet site.). Based on this, a POSITA thus would have understood that the packetized signals from the server delivering the media 20 would include packetized control signals as the terrain data, which is used to control the resistance, is delivered from the server and interpreted and applied to the system. Ex. 1005, 12:45-65.

174. Studor teaches that the packetized second signal could also include, in addition to the packetized control signal, a signal from a communication system. As I explained above with respect to Claim 21, once the media 20 is received from the server, computer system 16 (“communication system”) reproduces the second signal by transmitting it to M-S converter 14. Ex. 1005, 13:18-25 (“In response to the terrain characteristic information, a resistance is calculated and transmitted to the M-S converter 14, which provides appropriate control for the resistance system 22 of the exercise equipment 12.”). Studor expressly states that the “audio sub-

system 38” and “video sub-system 40” each “reproduces” the corresponding audio and video signals contained within media 20. Ex. 1005, 7:1-20. Thus, the audio and video signals are “a signal from a communication system.”

175. To the extent “consisting of” is a so-called “closed group,” Studor renders this limitation obvious. It would have been obvious to a POSITA to select a signal containing only (i) a packetized control signal; and (ii) a packetized control signal and a signal from a communication system. Packetized control signals for controlling the operating parameters of exercise devices were well known and one of only a small number of design choices for such a signal. For control signals sent over the Internet, it is the only possible design choice for such a signal.

176. Thus, Studor renders obvious “*an exercise device as recited in claim 1, wherein the packetized second signal comprises a signal selected from the group consisting of: (i) a packetized control signal; and (ii) a packetized control signal and a signal from a communication system*” as recited in the claim.

14. Claim 27

[27] An exercise device as recited in claim 1, wherein the packetized second signal comprises a packetized control signal and a signal from a trainer, the signal from the trainer comprising a signal selected from the group consisting of an audio signal and a visual signal.

177. Studor renders obvious the packetized second signal comprises a packetized control signal and a signal from a trainer, the signal from the trainer

comprising a signal selected from the group consisting of an audio signal and a visual signal.

178. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 19. I have been instructed by counsel to interpret “consisting of” the same way.

179. As I explained with respect to Limitations [1.3]/[29.3], a POSITA also would have understood that because the media 20, which includes terrain characteristic data (*i.e.*, control signals), is delivered via the Internet, which is a packet-based networking system, the computer system 16 would be receiving packetized control signals from the media 20 located on the server. *See* Ex. 1005, 8:29-37, 9:34-43 (“The media 20 may also contain software program 18, for loading into and execution on the computer system 16” and the software program 18 can be downloaded from an Internet site.). Based on this, a POSITA thus would have understood that the packetized signals from the server delivering the media 20 would include packetized control signals as the terrain data, which is used to control the resistance, is delivered from the server and interpreted and applied to the system. Ex. 1005, 12:45-65.

180. Furthermore, and as I explained with respect to Claim 5, Studor teaches a trainer that promulgates signals via a “stored trainer” according to the ’062 Patent (which is nevertheless still as “trainer” as claimed). In particular,

Studor expressly teaches a trainer in the form of a video, disk, or dynamic or interactive software program that sends audio and video information to the exercise device. Studor expressly states that “[t]he audio sub-system 38 of the computer system 16 reproduces the audio data stored in the media 20.” Ex. 1005, 7:1-12. Therefore, Studor teaches an audio signal from the trainer.

181. Studor also teaches a “video signal” from the trainer. “The video sub-system 40 reproduces video data stored in the media 20, and outputs either or both of television (TV) type video or SVGA signals to the monitor 42 used by the exercise system 10.” Ex. 1005, 7:13-16. Then, “[u]sers view the playback of video data on a monitor 42 (e.g., color television 46, TV goggles (not shown), or a computer monitor 48) which has suitable resolution and refresh rate to provide crisp viewing of video presentation.” Ex. 1005, 7:16-20.

182. To the extent a “live” trainer is necessary, I understand from Mr. Rutberg that a POSITA would have been motivated to send real-time audio and video to the user for interaction with a live trainer. Rutberg Decl., ¶¶ 68-71, 90-92, 107-108. In particular, Mr. Rutberg explains that a POSITA “would have been motivated to use such devices so the trainer could exercise during a real time two way communication with the user and then provide video/audio and control signals to the user from the exercise device.” *Id.*, ¶ 92.

183. A POSITA would have been motivated to use a live trainer who sends the packetized second signals, including audio, video, and control signals to the computer system 16 (“communication system”). First, Studor expressly teaches using a live trainer who provides the user with “workout commands” and implementing video conferencing. Ex. 1005, 9:14-20, 8:32-38, 15:52-53. Second, a POSITA would have recognized the convenience of automating that process, and would have further recognized that Studor’s system already had the communication and processing components necessary to do so, and therefore no additional components or equipment were necessary. Third, implementing a live trainer control signal was well within the capabilities of a POSITA, as demonstrated by Studor’s teachings of using a spinmaster or coach.

184. To the extent “consisting of” is a so-called “closed group,” Studor renders this limitation obvious. It would have been obvious to a POSITA to select a second signal containing only a packetized control signal and a signal from a trainer, the signal from the trainer comprising a signal selected from the group consisting of an audio signal and a visual signal. Control signals and signals from a trainer were one of only a finite number of choices for a POSITA and would have been obvious to try.

185. Therefore, Studor renders obvious “*the packetized second signal comprises a packetized control signal and a signal from a trainer, the signal from*

the trainer comprising a signal selected from the group consisting of an audio signal and a visual signal” as recited in claim.

15. Claim 28

[28] An exercise device as recited in claim 27, wherein receipt of said packetized second signal is substantially uninterrupted during receipt of said control signal.

186. Studor further teaches receipt of media 20 including the terrain characteristics data (“*packetized second signal*”) is substantially uninterrupted during receipt of said control signal.

187. Studor explains that the receipt of the control and video signals are all substantially uninterrupted. With respect to the video signals, Studor explains that “[f]or very high performance embodiments the video sub-system 40 may even be specially optimized with a proprietary video board to provide high resolution and *smooth varying speed* in the display of video data to the user.” ’062 Patent, 7:42-45 *see also id.*, 13:6-43 (“The video sub-system 40 ensures that video playback is smooth and consistent to minimize jerkiness.”).

188. Studor also explains that the control signal (*i.e.* the terrain characteristic data) is uninterrupted. “The terrain characteristic data is simultaneously collected with the video data using a time interval which ensures that changes in terrain characteristic seems smooth and continuous to the user.” Ex. 1005, 9:65-10:2. A POSITA would understand that data that is smooth and

continuous is substantially uninterrupted because any interruption would cause disruption or jerkiness

189. Therefore, Studor discloses “*receipt of said packetized second signal is substantially uninterrupted during receipt of said control signal*” as recited in the claim.

16. Claim 36

[36.1] An exercise device as recited in claim 29, further comprising a control panel, the control panel being configured to enable a user to input the first signal and to receive the second signal.

190. Studor discloses a computer with input devices in computer system 16 running a graphical user interface, and optionally, a keypad integrated into exercise equipment 12 (“*control panel*”), which is configured to enable a user to input the set up for the exercise session (“*first signal*”) and to receive media 20 including terrain characteristic data (“*second signal*”).

191. Studor discloses that computer system 16 uses a graphical user interface:

To facilitate ease of use of the exercise system 10 for setting-up exercise sessions, for interactively controlling them, and for later summarizing and comparing session statistics, existing user familiarity with conventional computer graphical user interfaces (GUI) may be used to great advantage (and for users lacking such experience, there is a wide range of training resources for such

GUI. For example, the computer system 16 may use typical GUI type operating systems such as Windows95 or WindowsNT (both T/M of Microsoft Corporation of Redmond, Wash.), or Macintosh System7 (T/M Apple Computers, Inc. of Cupertino, Calif.), or the Next operating system (T/M of Next Computer Corporation, of Menlo Park, Calif.).

Ex. 1005, 6:25-37.

192. For computer system 16 to use the graphical user interface, a POSITA would understand that the graphical user interface would have to run on a computer with input devices. By its definition, a user interface interfaces with a user. This means that the computer running the graphical user interface must have a way to interact with a user to obtain input. At the relevant time period, these input devices could have been in the form of a monitor and keyboard, a panel with buttons, or a microphone.

193. Using this computer with input devices, Studor teaches that the user can select options for their exercise session enabling the user to input the “*first signal*”:

In operation, the exercise system 10 is highly user interactive. However, the interactive features are not intrusive, as is the case for many prior art system. A setup procedure in the software program 18 provides instruction on the selection of exercise equipment 12 from a list of compatible types. Once a selection is made, the exercise system

10 then initializes itself to accept user speed data captured from the particular exercise equipment 12 chosen. The user is also asked to specify a desired nominal level of difficulty at which they would like to exercise (e.g., easy, realistic, hard), the type and parameters of audio output desired (e.g., volume, music or nature sounds, etc.), and what feedback information they would like to additionally see while exercising (e.g., pulse, speed, distance, calories, etc.). This information as feedback can be displayed on the monitor 42 (e.g., superimposed upon the video playback), on a display unit 72 (FIG. 2) incorporated into the exercise equipment 12, or even on another separate display device. Thus, a user may setup the exercise system 10 once for a particular exercise equipment 12, and then as needed for particular exercise sessions, and then not have to bother with anything further thereafter, because the exercise system 10 can take over.

Ex. 1005, 12:23-44.

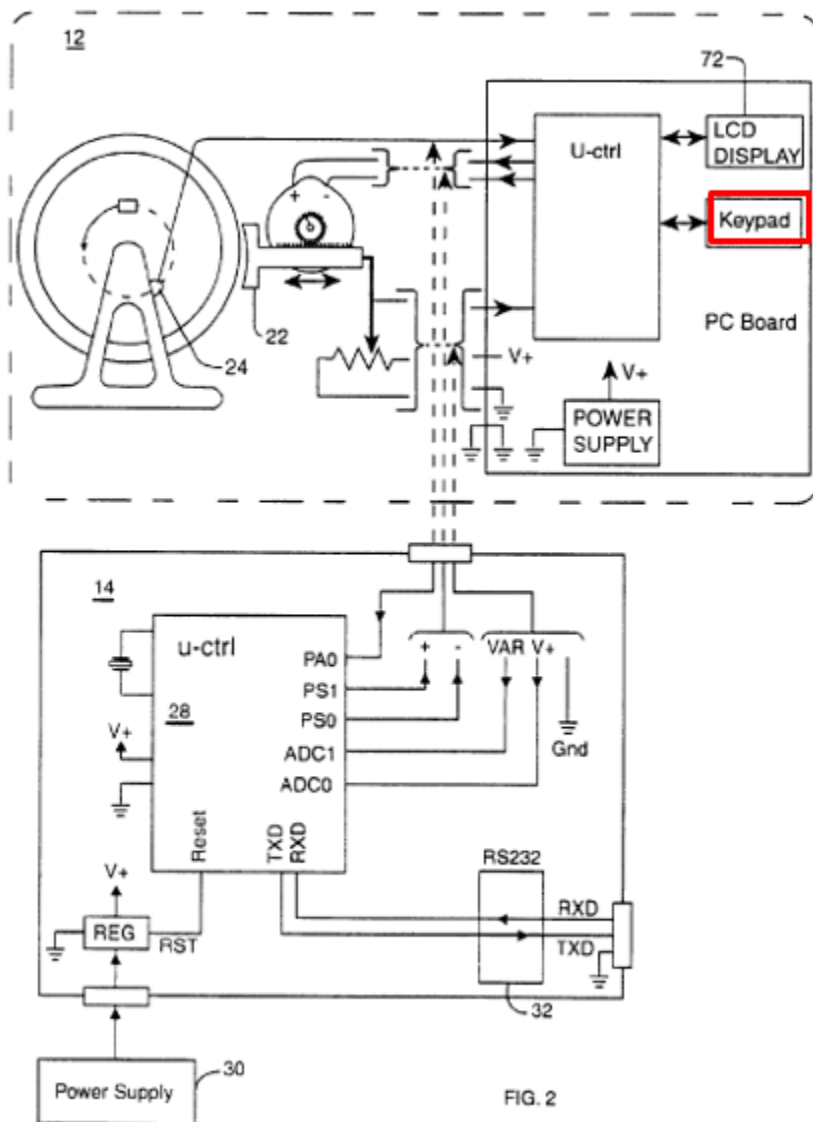
194. Using the computer with input devices, Studor also teaches that the graphical use interface would receive the terrain characteristic data (“*second signal*”) to display information to the user, such as terrain profile maps:

Further, in addition to their ease of use and the existing large base of already trained users, such GUI particularly lend themselves to real-time display and recording of exercise data (e.g., speed, heart rate, terrain profile maps, multiple exercise session comparisons, etc.). Such GUI and appropriate options in the software program 18

can thus allow users the flexibility to select what they want to display if anything. And, data acquisition of exercise data with third party evaluation programs, exercise journal software, internet/modem racing, and other features may be provided in enhanced embodiments of the exercise system 10.

Ex. 1005, 6:25-48.

195. Further, FIG. 2 shows that the exercise equipment includes a keypad.



Ex. 1005, Fig. 2 (annotated)

A POSITA would understand that the keypad is used to enable users to input data and would have been motivated to implement exercise equipment 12 to enable a user to input the set up for the exercise session using the keypad so that the user could begin the program immediately without leaving the exercise equipment 12.

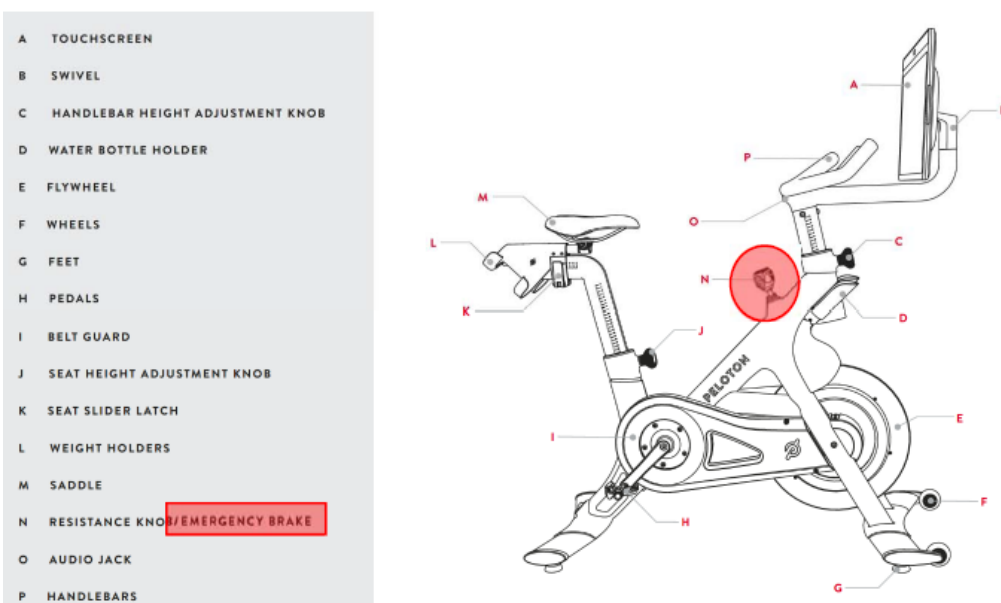
196. Thus, Studor discloses “*a control panel, the control panel being configured to enable a user to input the first signal and to receive the second signal*” as recited in the claim.

17. Claim 38

[38.1] An exercise device as recited in claim 29, wherein the exercise device further comprises a safety mechanism, said safety mechanism capable of manipulating the operating parameters of the exercise mechanism in the event that the packetized second control signal is interrupted.

197. For purposes of this IPR, I have been asked to construe this limitation based on how iFIT has apparently construed it in the district court litigation. I have been informed that in the district court, iFIT has stated that an emergency brake “is capable of manipulating the operating parameters by immediately stopping the flywheel upon activation of the emergency brake” and that iFIT has taken the position that the emergency brake is capable of immediately stopping the flywheel in the event the packetized second control signal is interrupted, as shown below.

The Bike+ further comprises a safety mechanism in the form of, for example, an emergency brake.



Peloton Bike+ Manual, p. 10–11 (PELOTON_ICON2_007903)

The emergency brake is capable of manipulating the operating parameters by immediately stopping the flywheel upon activation of the emergency brake.

The resistance knob can be used as an emergency brake. To stop immediately, push down on the resistance knob.

This bike has a direct driven flywheel. If the flywheel is moving, the pedals are moving. Removing your feet from the pedals while they are moving can cause serious injury. Stop by reducing pedaling frequency in a controlled manner or by using the emergency brake. Do not remove your feet from the pedals until the flywheel stops moving.

Peloton Bike+ Manual, p. 4 (PELOTON_ICON2_007900)

- **Emergency brake:** Press down on the resistance knob while pedaling slowly. The flywheel should come to a complete stop immediately. If it does not, stop using the bike immediately and contact Peloton Support.

Peloton Bike+ Manual, p. 40 (PELOTON_ICON2_007918)

On information and belief, in the event the packetized second control signal (i.e., JSON information) is interrupted, the emergency brake is capable of immediately stopping the flywheel.

Ex. 1014, 30-31.

198. Under this construction, Studor renders obvious this limitation. **First**, Studor teaches a braking system (“*safety mechanism*”) that can be used with the exercise equipment 12 to “automatically decrease the difficulty as needed”:

The exercise system 10 is also useful to aid in rehabilitation. Adapting the exercise system 10 to exercise equipment 12 that is designed for handicapped or disabled individual’s [sic] could aid in the individuals desire to continue physical therapy. Doctors involved in prescribing physical therapy could use the exercise system 10 to maintain motivation in their patients, even to the point that they would want to continue physical activity after their therapy ended. **Elderly people could use the exercise system 10 with a strict cap on their heart rate, with the exercise equipment 12 instructed to automatically decrease the difficulty as needed. This would ensure a safe workout for any individual who is in need of exercise for rehabilitation.**

Ex. 1005, 16:15-28.

199. **Second**, the braking system (“*safety mechanism*”) is capable of manipulating the operating parameters, like the resistance and speed, of exercise equipment 12. Studor explains that the braking system is part of resistance system 22:

Various exercise equipment 12 on the market today comes with any of several suitable configurations of both speed sensors 24 and

resistance systems 22. Alternately, such may easily be retro-fitted to many types of existing exercise equipment 12. Some commonly available speed sensors 24 include reluctor, hall-effect, tachometer, and pulse creating alternator type devices. **Some commonly used resistance systems 22 are friction and magnetic braking devices (e.g., electronically adjustable brakes using a motor or electromagnet system, and even brakes powered from an alternator used in the speed sensor 24).** These are typically controlled by motor-driven actuators, and many are able to provide feedback indicating the current brake setting.

Ex. 1005, 4:52-64.

200. **Third**, the braking system (“*safety mechanism*”) is capable of manipulating the operating parameters of exercise equipment 12, such as immediately stopping the flywheel, in the event that the terrain characteristics data, or alternatively, the control signal to synchronize the exercise devices in different continents (“*packetized second control signal*”) is interrupted. Studor teaches that the terrain characteristics data and the control signal to synchronize the exercise devices in different continents can control the resistance system 12:

The comprehensive experience which the exercise system 10 provides makes high degrees of realistic simulation possible. On the right type of exercise equipment (e.g., an exercycle), features like cadence can be simulated. Simulated gravitational momentum is another particularly useful simulation feature. **Changes in resistance can be**

controlled to simulate the effects of mass and momentum as would occur when traveling on the real slopes used to create terrain course data 68. Addition of a suitable heart rate sensor and appropriate modules in the software program 18 can provide the ability to have a constant metabolic rate workout (either as still further enhancement of the “gear” type simulation example below, or entirely separately).

Ex. 1005, 14:3-15.

Emerging technology is continually remolding the definition of what is a computer system, and the present exercise system 10 is quite able to employ such evolving technology to advantage. It should particularly be noted that not all components of the computer system 16 need to be physically present in one “box,” or even at one location. Computer networking, and particularly the Internet, are today broadening computer capabilities considerably. The exercise system 10 may also use such technology. **For example, users located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold “communal” exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.**

Ex. 1005, 8:24-38.

201. With any application that is connected to a network, a POSITA implementing Studor would have to determine how to program exercise system 10

in the event the network connection is interrupted. For example, in a navigation application, when the signal is interrupted, if part of the route was already downloaded the navigation could continue in case the signal is able to be restored. The navigation could continue on the same path for a set amount of time in case the signal is able to be restored. And the navigation can stop. The application would need to account for situations where the signal is being interrupted intermittently but can reconnect, and for situations where the signal is interrupted completely. In the former, a POSITA would want to give some window where the connection can be restored. Otherwise, if the navigation immediately stops and then starts every time a signal is interrupted in a location where there is a bad connection, this could lead to a bad user experience.

202. Here, a POSITA implementing Studor could do something very similar. If the exercise program is already downloaded, the program could continue or the resistance and speed could continue for a set amount of time to provide time for the signal to be restored. Optionally, if it appears that the network connection is interrupted indefinitely, the braking system could immediately stop the flywheel or other movable element. By accounting for both situations, a POSITA could provide the user with a better experience—the system does not automatically stop or slow down, and then start again every time the connection is lost and then restored.

203. In addition, I understand from Mr. Rutberg that in the event of signal interruption, gradually slowing down, decreasing resistance or incline, etc. could be preferred over sudden or immediate stoppage of the moveable elements of the exercise device (*e.g.* flywheel, pedals, tread, etc.). Rutberg Decl., ¶¶ 96-101, 112.

204. Using a braking system to manipulate the operating parameters of the exercise equipment upon a certain event (such as the absence of heart rate data or interruption of other signal) is also consistent with what was known in the art at the time. For example, U.S. Patent No. 5,591,104 (“Andrus”) describes a “pause status” in which “load resistance is set to its lowest value, giving the user an opportunity to rest or dismount.” Ex. 1016, 14:62-15:8. Similarly, U.S. Patent No. 5,318,487 (“Golen”) discloses a “safety module” used “to ensure that the system 52 does not continue to operate without sufficient heart rate data.” Ex. 1017, 21:5-53.

205. Implementing a braking system in the event the packetized second control signal is interrupted is consistent with Studor’s teaching to ensure “a safe workout.” Ex. 1005, 16:26-27. A POSITA would have understood that if the signal is interrupted, the resistance and speed of the exercise equipment 12 should not continue indefinitely. For example, if the signal is interrupted at a particular difficult or intense level, this could be dangerous for the user. A POSITA implementing Studor would have been motivated to implement the same braking

system used “to automatically decrease the difficulty” when the user’s heart rate is too high to brake the exercise equipment 12 if the terrain characteristics data or the asynchronous control signal is interrupted.

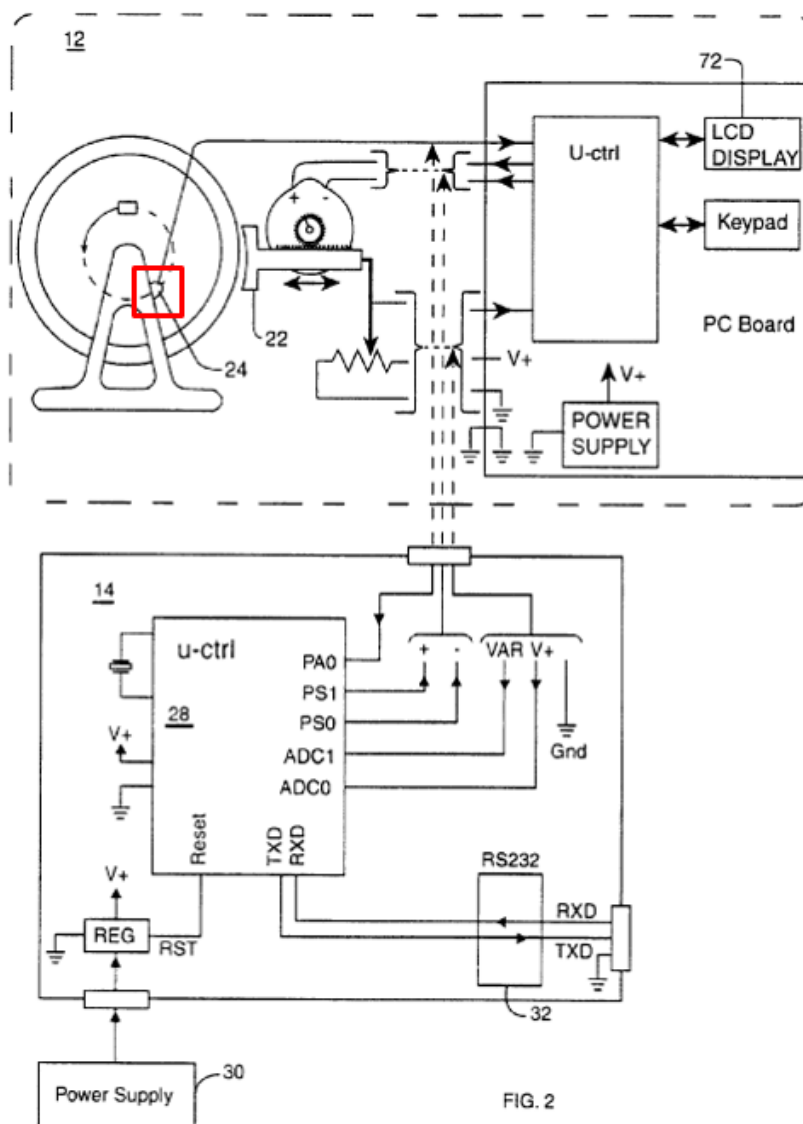
206. Thus, Studor renders obvious “*a safety mechanism, said safety mechanism capable of manipulating the operating parameters of the exercise mechanism in the event that the packetized second control signal is interrupted*” as is recited in the claim.

18. Claim 40

[40.1] An exercise device as recited in claim 29, wherein the exercise device further comprises one or more sensors, said one or more sensors being configured to sense the one or more operating parameters of the exercise mechanism.

207. Studor teaches speed sensor 24 (“*one or more sensors*”) configured to sense the one or more operating parameters of exercise equipment 12 (“*exercise mechanism*”).

208. As shown below in Figure 2, speed sensor 24 is located by the flywheel of exercise equipment 12, and communicates with micro controller 28 of M-S converter 14:



Ex. 1005, Fig. 2 (annotated)

209. The speed sensor 24 “provides data from which the user’s actual efforts can be inferred.” Ex. 1005, 4:49-51. M-S converter 14 “acquire[s] data from the speed sensor 24.” Ex. 1005, 5:7-8. “M-S converter 14 is able to controllably adjust the resistance system 22 on the exercise equipment 12 as a function of the

speed data received and the parameters contained in the course information (*i.e.*, terrain characteristics, *see e.g.*, FIGS 7 and 8).” Ex. 1005, 11:37-42.

210. Studor explains that speed sensors to sense the speed of exercise equipment are commonly available:

Various exercise equipment 12 on the market today comes with any of several suitable configurations of both speed sensors 24 and resistance systems 22. Alternately, such may easily be retro-fitted to many types of existing exercise equipment 12. **Some commonly available speed sensors 24 include reluctance, hall-effect, tachometer, and pulse creating alternator type devices [sic].** Some commonly used resistance systems 22 are friction and magnetic braking devices (*e.g.*, electronically adjustable brakes using a motor or electromagnet system, and even brakes powered from an alternator used in the speed sensor 24). These are typically controlled by motor-driven actuators, and many are able to provide feedback indicating the current brake setting.

Ex. 1005, 4:52-64.

211. Thus, Studor discloses “*one or more sensors, said one or more sensors being configured to sense the one or more operating parameters of the exercise mechanism*” as recited in the claim.

19. Claim 45

[45.1] An exercise device as recited in claim 29, wherein the exercise device further comprise a diagnostic control, said diagnostic control activating a connection with a communication system to check the status of the exercise device.

212. Studor discloses that the exercise system includes update detection (“*diagnostic control*”) that activates a connection with a bulletin board, BBS, or Internet site, or alternatively, with the server computer hosting media 20 in computer system 16 (“*communication system*”) to check whether new versions or updates of software program 18 or the video drivers are available (“*check the status of the exercise device*”).

213. Studor discloses that the user can be prompted to install new versions of software program 18 and video card drivers:

The media 20 may also contain the software program 18, for loading into and execution on the computer system 16. However this is not a requirement. **The software program 18 may be supplied entirely separately (e.g., downloaded from a bulletin board, BBS, or an Internet site).** The executed version of the software program 18 may be stored in mass storage on the computer system 16, rather than it being loaded from the media 20 each time before use, thus permitting all of the capacity of a unit of the media 20 to be dedicated to the data files 50. Alternately, a version of the software program 18 may be included in some (not necessarily all) instances of the media 20, and **if an existing version which is already loaded and executing on the**

computer system 16 detects that the version stored on the media 20 is newer (i.e., an upgrade, entirely or in part), the user may be prompted whether they want to install the new version from the media 20 into the computer system 16 for use thereafter. Further, as somewhat already discussed, still additional types of data may also be stored on the media 20 (e.g., video driver updates).

Ex. 1005, 9:34-53.

214. Studor further teaches that the update detection can be run through the operating system of computer system 16, which will help guide the user through the process:

Regardless of what type of video board is employed, the media 20 may optionally include the newest versions of suitable video drivers. In this manner, **when the media 20 is loaded onto the computer system 16 the drivers may be checked for currentness** (e.g., with a Windows95 auto-run procedure), and if appropriate the users with little or no computer experience can update the drivers by being guided through the update process.

Ex. 1005, 8:15-22.

215. A POSITA would understand that to check the status of the software (i.e., to determine whether the exercise system has the most current version of the software), a network connection would need to be formed with the system on which the current version resides. For example, if the exercise system is

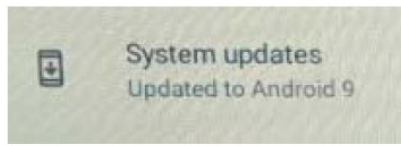
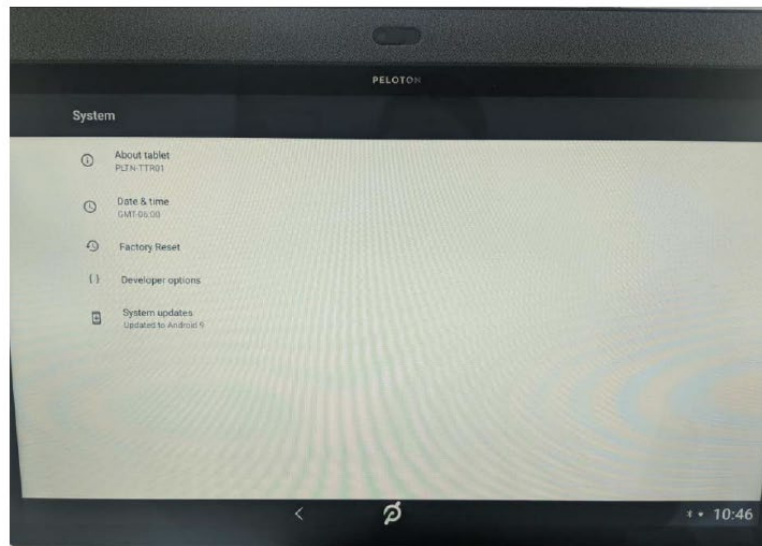
determining whether a software update exists on media 20 on the server computer in computer system 16 as taught by Studor, an Internet connection would be formed with the server computer.

216. Similarly, if the exercise system is checking a bulletin board, BBS (bulletin board system), or Internet site for the latest version of software program 18, a connection would need to be formed with the system hosting the bulletin board, BBS, or Internet site.

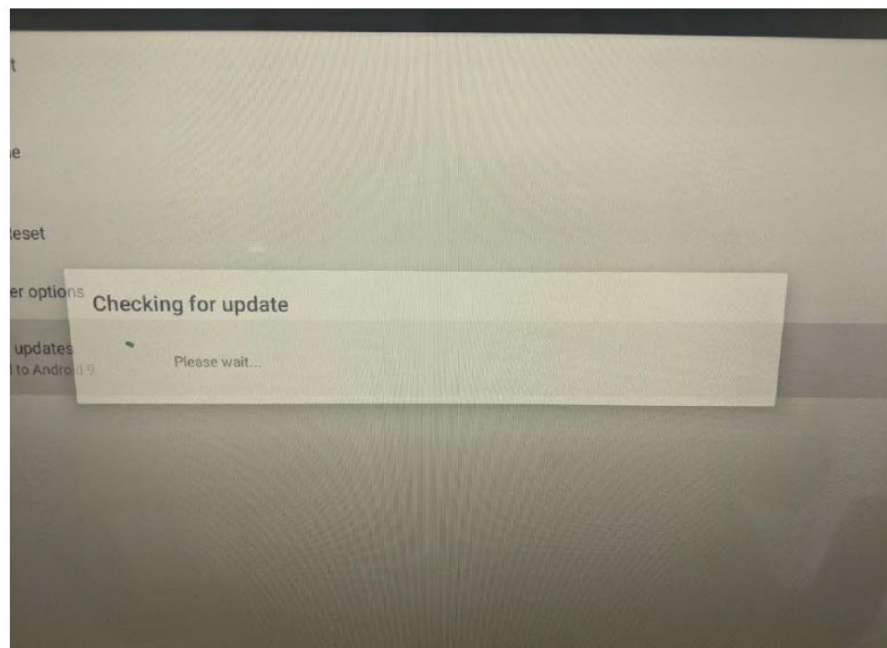
217. I understand that diagnosing and improving a local system using software updates is consistent with how iFIT has construed “diagnostic control” in the district court litigation. I have been informed that in the district court, iFIT has stated a system updates button on the touchscreen that, when pressed, activated a connection with the remote serve to check the status of the exercise device.

Declaration ISO Pet. for *Inter Partes* Review of USP 7,166,062

The Bike+ comprises a diagnostic control, for example, in the form of the system updates button on the touchscreen.



Upon pressing the system updates button, a connection is activated with the remote server (i.e., communication system) to check the status of the exercise device.



Ex. 1014, 32-33.

218. A diagnostic control that checked the status of software was well-known by the relevant time period. For example, U.S. Patent 5,845,077 (“Fawcett”) described an update service (“*diagnostic control*”) that automatically inventoried the user computer “to determine what computer software may be out-of-date, and/or need maintenance updates.”

Creators of computer software provide the most up-to-date versions of their computer software on an update service. A user who has purchased computer software calls the update service on a periodic basis. **The update service automatically inventories the user computer to determine what computer software may be out-of-date, and/or need maintenance updates.** If so desired by the user, the update service computer automatically downloads and installs computer software to the user computer. By making periodic calls to the update service, the user always has the most up-to-date computer software immediately available. The update service may also alert the user to new products (*i.e.* including new help files, etc.), and new and enhanced versions of existing products which can be purchased electronically by a user from the update service.

Ex. 1020, Abstract.

219. By way of another example, U.S. Patent. No. 6,151,643 (“Cheng”) likewise taught an application (“*diagnostic control*”) that “first determine[s] the products that are installed in the client computer” and then determines “whether

there is an update available for a more recent version of the software product than that installed on the client computer.”

On each user computer, or synonymously client computer, operating in accordance with one embodiment of the invention there is provided a **client application that periodically connects over the network to the update database of the service provider computer system.** The client application automatically downloads a portion of the database to the client computer, preferably to update a mirror of portions of database. **From client database, the client application determines which software updates are applicable or relevant to the user’s computer. This is preferably done by first determining the products that are installed in the client computer, and determining for each of these whether there is an update available for a more recent version of the software product than that installed on the client computer. The applicable software updates are identified to the user.**

The user selects various software updates for installing on the client computer. Either the client application or the service provider computer then uses the network location specified in the database to connect to the computer system of the software vendor and download the software update from there to the client computer.

Ex. 1021, 3:25-45.

220. Further, at the relevant time, checking the availability of software updates through a network connection was a well-known option in the art. *See*,

e.g., Ex. 1020, 1:38-52 (software updates allow for fixing defects). Notably, checking the availability of software updates through a network connection could allow for automatic updates. Forcing a user to look for updates creates more friction and made it less likely that user would update the software. Further, it is likely that the user would only look for updates if there was an existing problem with the software. Providing the status of the software through a network connection requires little work on the part of the user. Given these advantages, a POSITA would be motivated to include a diagnostic control that activates a connection with a communication system to check the status of the exercise device, particularly given Studor's teachings related to software updates.

221. Thus, Studor renders obvious "*the exercise device further comprise a diagnostic control, said diagnostic control activating a connection with a communication system to check the status of the exercise device*" as recited in the claim.

20. Claim 46

[46.1] An exercise device as recited in claim 45, wherein the diagnostic control activates a downloading process to retrieve one or more software updates the from communication system.

222. Studor discloses that the update detection ("*diagnostic control*") activates a downloading process to retrieve a new version or update of software program 18 or video drivers ("*software updates*") from a bulletin board, BBS, or

Internet site, or alternatively, from the server computer hosting media 20 (“*communication system*”).

223. Studor discloses that the user can download new or updated versions of software program 18 from multiple sources:

The media 20 may also contain the software program 18, for loading into and execution on the computer system 16. However this is not a requirement. **The software program 18 may be supplied entirely separately (e.g., downloaded from a bulletin board, BBS, or an Internet site).** The executed version of the software program 18 may be stored in mass storage on the computer system 16, rather than it being loaded from the media 20 each time before use, thus permitting all of the capacity of a unit of the media 20 to be dedicated to the data files 50. Alternately, a version of the software program 18 may be included in some (not necessarily all) instances of the media 20, and if an existing version which is already loaded and executing on the computer system 16 detects that the version stored on the media 20 is newer (*i.e.*, an upgrade, entirely or in part), **the user may be prompted whether they want to install the new version from the media 20 into the computer system 16 for use thereafter. Further, as somewhat already discussed, still additional types of data may also be stored on the media 20 (e.g., video driver updates).**

Ex. 1005, 9:34-53.

224. I understand that diagnosing and improving a local system by downloading software updates is consistent with how iFIT has construed

“diagnostic control” in the district court litigation. I have been informed that in the district court, iFIT has stated that upon pressing the system updates button, the downloading process to retrieve one or more system updates from the communication system is activated.

Step 3: Tap on 'System updates'.

This will tell you whether or not you have the latest available version of software on your device.

If you do not, you will be able to begin the update process in the pop-up window that displays on your screen.

<https://support.onepeloton.com/hc/en-us/articles/4402287359380-How-Do-I-Verify-That-I-Have-The-Latest-System-Updates->

Ex. 1014, 33-34.

225. A diagnostic control updates software by activating a downloading process from a communication system. For example, U.S. Patent 5,845,077 (“Fawcett”) described an update service (“*diagnostic control*”) that automatically inventoried the user computer “to determine what computer software may be out-of-date, and/or need maintenance updates.” And if the software was out-of-date, the service “automatically downloads and installs computer software to the user computer.”:

Creators of computer software provide the most up-to-date versions of their computer software on an update service. A user who has purchased computer software calls the update service on a periodic basis. The update service automatically inventories the user computer to determine what computer software may be out-of-date, and/or need

maintenance updates. If so desired by the user, the **update service computer automatically downloads and installs computer software to the user computer**. By making periodic calls to the update service, the user always has the most up-to-date computer software immediately available. The update service may also alert the user to new products (*i.e.* including new help files, etc.), and new and enhanced versions of existing products which can be purchased electronically by a user from the update service.

Ex. 1020, Abstract.

226. By way of another example, U.S. Patent. No. 6,151,643 (“Cheng”) likewise taught an application (“*diagnostic control*”) that “first determine[s] the products that are installed in the client computer” and then determines “whether there is an update available for a more recent version of the software product than that installed on the client computer.” Subsequently, the application “download[s] the software update from [the computer system of the software vendor] to the client computer.”

On each user computer, or synonymously client computer, operating in accordance with one embodiment of the invention there is provided a client application that periodically connects over the network to the update database of the service provider computer system. The client application automatically downloads a portion of the database to the client computer, preferably to update a mirror of portions of database. From client database, the client application determines which

software updates are applicable or relevant to the user's computer. This is preferably done by first determining the products that are installed in the client computer, and determining for each of these whether there is an update available for a more recent version of the software product than that installed on the client computer. The applicable software updates are identified to the user.

The user selects various software updates for installing on the client computer. **Either the client application** or the service provider computer **then uses the network location specified in the database to connect to the computer system of the software vendor and download the software update from there to the client computer.**

Ex. 1021, 3:25-45.

227. It was well within the knowledge of a POSITA that a diagnostic control that activated a downloading process from a communication system had several advantages, including reducing user related installation problems, avoiding the need for storage media, and ensuring that if the software gets corrupted, the user can get a new up-to-date copy of the software.

The update service has several advantages. A user is automatically provided with information about the available versions of computer software as result of the inventory conducted by the update center computer. If the version of the computer software on the user computer has defects that are known and have been corrected, the user is alerted to this fact and is offered an up-to-date version of the

computer software. The user is also alerted to the availability of new computer software, or enhanced versions of existing computer software, and can purchase them electronically. **In either case, the most up-to-date versions of computer software are available for downloading to users.**

The available versions of the computer software can also be automatically installed on the user computer. **Since it is no longer necessary for the user to install the computer software, the incidence of user related installation problems is greatly reduced. It is also not necessary for the user to obtain or save any storage media since the computer software is downloaded directly to the user computer. If the computer software installed on the user computer ever gets corrupted, the user can call the update service (e.g. for some limited number of iterations) and download a new (and up-to-date) copy of the computer software.**

Ex. 1020, 3:3-24. Given these advantages, a POSITA would be motivated to include such a diagnostic control when implementing the exercise system of Studor, particularly given Studor's teachings related to software updates.

228. Thus, Studor renders obvious "*the exercise device further comprise a diagnostic control, said diagnostic control activating a connection with a communication system to check the status of the exercise device*" as recited in the claim.

D. Independent Claim 49

[49.0] An exercise device configured to enable a user to receive workout-related information, comprising:

229. Studor teaches an exercise device. See Ground 1 Limitations [1.0]/[29.0].

230. Studor further teaches that the user can receive media 20 that will simulate a real-world course or allow the user to participate in “communal exercise sessions in concert, [] competitive sporting events, or [] coached exercise regimes” (“enable the user to receive workout-related information”). Ex. 1005, 9:54-56 (“The media 20 used with the exercise system 10 are produced by acquiring position and terrain characteristics for real-world courses.”), 8:32-38 (“For example, users located on different continents may employ the exercise system 10 with internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold ‘communal’ exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.”).

[49.1] an exercise mechanism comprising a movable element for movement in performance of exercise by a user;

231. Studor discloses “an exercise mechanism comprising a movable element for movement in performance of exercise by a user.” See Ground 1 Limitations [1.1]/[29.1].

[49.2] a user interface device communicating with the exercise mechanism and configured to gather one or more user control signals from the user;

232. Studor discloses a user interface device communicating with the exercise mechanism. See Ground 1 Limitations [1.2]/[29.2].

233. Studor further discloses that the user interface device is configured to gather one or more user control signals from the user in that it receives input from the user to set up exercise sessions, which “controls” the exercise session.

To facilitate ease of use of the exercise system 10 for setting-up exercise sessions, for interactively controlling them, and for later summarizing and comparing session statistics, existing user familiarity with conventional computer graphical user interfaces (GUI) may be used to great advantage (and for users lacking such experience, there is a wide range of training resources for such GUI)... **Such GUI and appropriate options in the software program 18 can thus allow users the flexibility to select what they want to display if anything.** And, data acquisition of exercise data with third party evaluation programs, exercise journal software, internet/modem racing, and other features may be provided in enhanced embodiments of the exercise system 10.

Ex. 1005, 6:25-48; *see also* 9:54-10:32 (describing data on media 20 to control exercise equipment 12), 11:5-15 (“transmits control data through the communications link 26 to the M-S converter 14 for the dynamic control of the resistance system 22.”), 12:23-44 (discussing exercise session setup procedures).

234. Thus, Studor discloses “*a user interface device communicating with the exercise mechanism and configured to gather one or more user control signals from the user*” as recited in the claim.

[49.3] a communicating mechanism in communication with the user interface device and adapted to enable transmission of the user control signals to a remote communication system, the communicating mechanism being further adapted to receive a packetized second signal including synchronized control signals from the remote communication system;

235. Studor teaches a communicating mechanism in communication with the user interface device and adapted to receive a packetized second signal. *See* Ground 1 Limitations [1.3]/[29.3].

236. Studor further teaches that the packetized second signal includes synchronized control signals from the remote communication system. *See* Ground 1 Claim [4]; Ex. 1005, 8:65-9:3 (describing data included in media 20), 9:34-10:2 (“synchronizing information in the media 20”); 10:15-57 (describing how terrain characteristics data is simulated); 11:22-26 (“The terrain data corresponding to the current ‘position in the exercise course is then fetched and processed and the process adjusts the video playback rate to synchronize the video position with the virtual position of the user within the exercise course”).

237. Thus, Studor renders obvious “*a communicating mechanism in communication with the user interface device and adapted to enable transmission of the user control signals to a remote communication system, the communicating*

mechanism being further adapted to receive a packetized second signal including synchronized control signals from the remote communication system” as recited in the claim.

[49.4] means for reproducing the second signal; and

238. Studor discloses “means for reproducing the second signal.” See Ground 1 Claim [21]; Ex. 1005, 7:1-2 (“The audio sub-system 38 of the computer system 16 reproduces the audio data stored in the media 20.”); 7:7-10 (“To convert electrical signals into sounds which users can hear, the audio sub-system 38 also includes at least one speaker 44 (or headphones).”), 8:12-16 (“The video sub-system 40 reproduces video data stored in the media 20, and output either or both of television (TV) type video or SVGA signals to the monitor 42 used by the exercise system 10.”), 13:18-25 (discussing reproducing terrain characteristics data).

239. Thus, Studor discloses “*means for reproducing the second signal*” as recited in the claim.

[49.5] means, responsive to the synchronized control signals carried by the second signal, for controlling the operating parameters of the exercise mechanism

240. Studor teaches “means, responsive to the synchronized control signals carried by the second signal, for controlling the operating parameters of the exercise mechanism.” See Ground 1 Limitations [1.4]/[29.4].

241. Studor further teaches micro controller 28 is responsive to the synchronized control signals to control the operating parameters of the exercise mechanism. *See* Ground 1 Limitations [1.4]/[29.4].

242. Thus, Studor discloses “*means, responsive to the synchronized control signals carried by the second signal, for controlling the operating parameters of the exercise mechanism*” as recited in the claim.

* * *

243. Given the above, claim 49 is rendered obvious over Studor.

E. Claims Dependent on Claim 49

1. Claim 50

[50] An exercise device as recited in claim 49, wherein the user interface device comprises one or more manually activated controls configured to generate the user control signals

244. Studor discloses “*the user interface device comprises one or more manually active controls configured to generate the user control signals.*”

245. When a user sets up an exercise session, that input is captured by the user interface:

To facilitate ease of use of the exercise system 10 for setting-up exercise sessions, for interactively controlling them, and for later summarizing and comparing session statistics, existing user familiarity with conventional computer graphical user interfaces (GUI) may be used to great advantage (and for users lacking such

experience, there is a wide range of training resources for such GUI).... **Such GUI and appropriate options in the software program 18 can thus allow users the flexibility to select what they want to display if anything.** And, data acquisition of exercise data with third party evaluation programs, exercise journal software, internet/modem racing, and other features may be provided in enhanced embodiments of the exercise system 10.

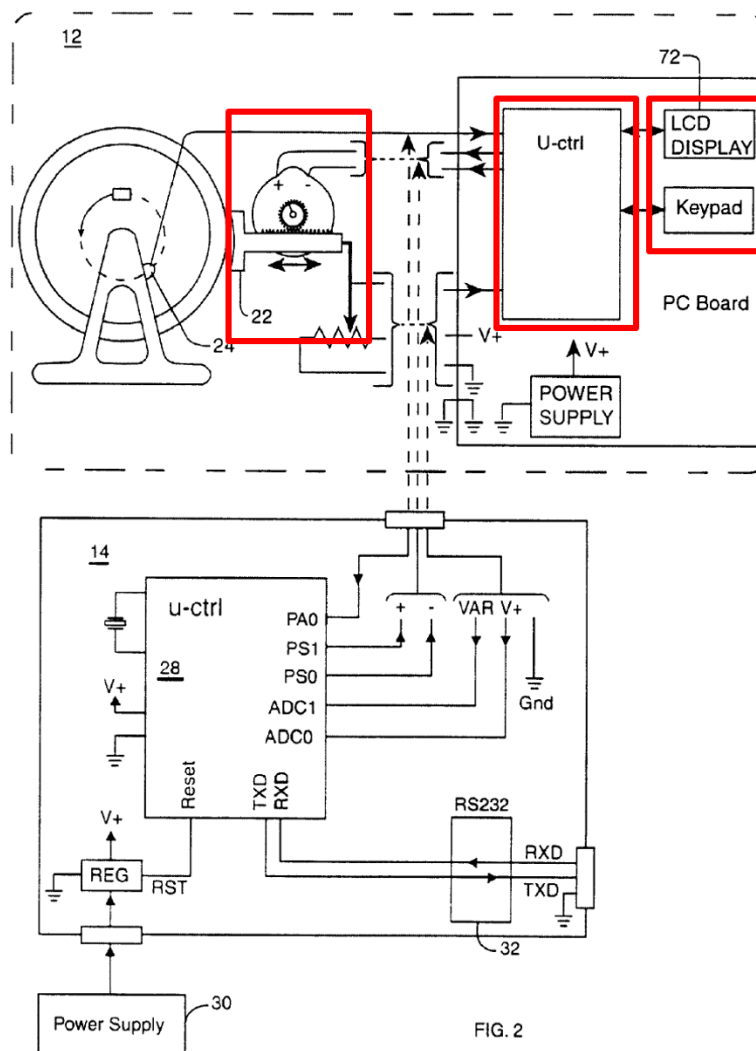
Ex. 1005, 6:25-48; *see also* 9:34-43, 9:54-10:32, 11:5-15, 12:23-44.

An advantage of the present invention is that very dynamic exercise may be carried out with it, yet without undue user involvement in setting effort levels for the exercise. **A user may, optionally, initially set a nominal difficulty level, and then let the inventive exercise system dynamically control the difficulty thereafter, to present that varying effect of exercising in the changing terrain of a real world exercise course.**

Ex. 1005, 3:23-30.

246. Specifically, Studor explains that the user sets the “**nominal difficulty level for exercise by adjusting the resistance system 22**”, then, as the exercise equipment 12 is operated, the speed sensor 24 provides data from which the user’s actual efforts can be inferred.” Ex. 1005, 4: 45-51. Furthermore, a POSITA would understand that the user would set the “nominal difficulty level” through the user interface in display 72. Figure 2 shows that the LCD DISPLAY

and Keypad feed directly into the “U-ctrl” module which in turn sets the resistance 22:



Ex. 1005, Fig. 2 (annotated).

247. Therefore, Studor discloses “*the user interface device comprises one or more manually active controls configured to generate the user control signals*” as recited in the claim.

2. Claim 52

[52] An exercise device as recited in claim 49 wherein the second signal comprises one or more audio and video signals and the synchronized control signal.

248. Studor discloses “*the second signal comprises one or more audio and video signals and the synchronized control signal.*” See Ground 1 Claim [4].

3. Claim 54

[54] An exercise device as recited in claim 49, wherein the communication system receives the one or more audio and video signals and the synchronized control signals from an exercise device of a trainer.

249. Studor expressly teaches using a live trainer, and in particular a live trainer that provides “workout commands.” Ex. 1005, 9:14-20 (“Multiple types of audio files 54 may be provided. Two of these, voice audio files 58 (*e.g.*, currently popular Spinning Workouts at health clubs could be done at home in the natural environment simulation provided by the exercise system 10, with ***a spinmaster giving workout commands***) and music audio files 60 are used in generally conventional manners.”); *see also* Ex. 1005, 8:32-38 (“For example, users located on different continents may employ the exercise system 10 with internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold ‘communal’ exercise sessions in concert, for competitive sporting events, or ***for coached exercise regimes.***”), 15:47-53 (“Of course, separated multiple users of the exercise system 10 in situations like those

described above might want to communicate with and actively perceive each other. This is possible with *realistic audio and even visual communication over networks* in the computer system 16, using increasingly common technology (*e.g.*, by incorporating “video conferencing” type capability into the exercise system 10).”). A POSITA would have been motivated to and would have known how to utilize Studor’s “spinmaster” to give commands that correspond to a control signal.

250. To the extent a “live” trainer is necessary, I understand from Mr. Rutberg that a POSITA would have been motivated to send real-time audio or video to the user for interaction with a live trainer. Rutberg Decl., ¶¶ 68-71, 90-92, 107-108. In particular, Mr. Rutberg explains that a POSITA “would have been motivated to use such devices so the trainer could exercise during a real time two way communication with the user and then provide video/audio and control signals to the user from the exercise device.” *Id.*, ¶ 92.

251. A POSITA would have been motivated to use a live trainer whose exercise device sends the packetized second signals, including audio, video, and control signals to the server computer of computer system 16 (“*communication system*”). First, Studor expressly teaches using a live trainer who provides the user with “workout commands” and implementing video conferencing. Ex. 1005, 9:14-20, 15:47-53. Second, a POSITA would have recognized the convenience of automating that process, and would have further recognized that Studor’s system

already had the communication and processing components necessary to do so, and therefore no additional components or equipment were necessary. Third, implementing a live trainer control signal was well within the capabilities of a POSITA, as demonstrated by Studor's teachings of using a spinmaster or coach. I note that a stored "trainer" would not have an exercise device and therefore would not be encompassed here.

252. Thus, Studor renders obvious "*the communication system receives the one or more audio and video signals and the synchronized control signals from an exercise device of a trainer*" as recited in the claim.

4. Claim 56

[56] *An exercise device as recited in claim 49, wherein the exercise device communicates with the communication system via a network.*

253. Studor discloses "*the exercise device communicates with the communication system via a network.*"

254. Studor states that the "users located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server, perhaps actually located on yet another continent." Ex. 1005, 8:23-37, 15:43-45 (discussing global implementation over the Internet), 6:50-55 ("computer system 16 includes a network computer or network terminal").

Therefore, the exercise system 10 communicates with computer 16 over the Internet, which is a type of network.

255. Thus, Studor discloses “*the exercise device communicates with the communication system via a network*” as recited in the claim.

5. Claim 57

[57] An exercise device as recited in claim 56, wherein the network comprises a network selected from the group consisting of a wide area network, a local area network, a home network, a packetized network, and the Internet.

256. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 52-53. I have been instructed by counsel to interpret “consisting of” the same way.

257. Studor renders obvious “*the network comprises a network selected from the group consisting of a wide area network, a local area network, a home network, a packetized network, and the Internet.*” As explained above with respect to Claim 56, Studor states that “users located on different continents may employ the **exercise system 10 with Internet connected network computers (NC) and media 20 on a server**, perhaps actually located on yet another continent.” Ex. 1005, 8:23-37.

258. To the extent “consisting of” is a so-called “closed group,” Studor renders this limitation obvious. It would have been obvious to a POSITA to select a network from the group of only a wide area network, a local area network, a

home network, a packetized network, and the Internet. There were only a finite number of network types for a POSITA to choose from, wide area networks, a local area networks, home networks, packetized networks, and the Internet among them. A POSITA would have had good reason to try those network types and would have been a matter of design choice.

259. Thus, Studor renders obvious “*the network comprises a network selected from the group consisting of a wide area network, a local area network, a home network, a packetized network, and the Internet*” as recited in the claim.

6. Claim 59

[59] An exercise device as recited in claim 49, wherein the means for reproducing the second signal comprises one or more audio output devices and one or more video output devices.

260. Studor discloses “*the means for reproducing the second signal comprises one or more audio output devices and one or more video output devices.*” See Ground 1 Limitation [49.3].

7. Claim 61

[61] An exercise device as recited in claim 49, wherein the communication system analyses the user control signals and generates the packetized second signals based upon the analysis of the user control signals.

261. Studor renders obvious “*the communication system analyses the user control signals and generates the packetized second signals based upon the analysis of the user control signals.*”

262. As I explained above with respect to Limitations [49.2] and [49.3], the user interface is configured to gather one or more user control signals from the user in that it receives input from the user to set up exercise sessions:

To facilitate ease of use of the exercise system 10 for setting-up exercise sessions, for interactively controlling them, and for later summarizing and comparing session statistics, existing user familiarity with conventional computer graphical user interfaces (GUI) may be used to great advantage (and for users lacking such experience, there is a wide range of training resources for such GUI)... **Such GUI and appropriate options in the software program 18 can thus allow users the flexibility to select what they want to display if anything.** And, data acquisition of exercise data with third party evaluation programs, exercise journal software, internet/modem racing, and other features may be provided in enhanced embodiments of the exercise system 10.

Ex. 1005, 6:25-48; *see also* 9:34-43, 9:54-10:32, 11:5-15, 12:23-44.

263. Studor therefore teaches that software 18 uses the data in media 20 to simulate terrain changes in a given course, and that terrain data is simulated to the user of the exercise equipment in response to the chosen exercise routine.

264. Studor's disclosure is consistent with iFIT's interpretation of this claim for purposes of infringement. iFIT contends that the server "analyzes the user

control signals” by providing the “Target Metrics” in response to the user selecting a particular exercise class:

Claim 61	
An exercise device as recited in claim 49, wherein the communication system analyses the user control signals and generates the packetized second signals based upon the analysis of the user control signals.	On information and belief, the remote server (i.e., communication system) analyzes the user control signals that are generated in response to a user selecting an on-demand class. “Once a user selects an on-demand class and before the class starts, the Bike+ requests the class’s information including Target Metrics (i.e., including the time stamps and suggested ranges for speed and resistance) through an Application Programming Interface (API).” (Vivori Decl., ¶ 6) On information and belief, based off of this analysis of the user control signal, the remote server generates a packetized second signal.

Ex. 1014, 51 (annotated). That is what Studor teaches. The data from media 20, which is determined by the user’s selection, contains the “table files 56 of normalized terrain characteristic data (e.g., slope data), which associate terrain characteristics to particular times in a video files 52.” Ex. 1005, 8:65-13.

265. Thus, Studor renders obvious “*the communication system analyses the user control signals and generates the packetized second signals based upon the analysis of the user control signals*” as recited in the claim.

F. Independent Claim 78

[78.0] An exercise device for enabling one or more users to select and perform an exercise program stored on a communication system, the exercise device comprising

266. Studor teaches an exercise system 10 (“exercise device”), which includes “exercise equipment 12, ... a M-S converter 14, which acquires data from and controls some aspects of the operation of the exercise equipment 12; and a

computer system 16, which uses a software program 18 and pre-recorded media 20, to operate the exercise system 10.” Ex. 1005, 4:28-37.

267. Studor teaches that the terrain characteristics data corresponds with a real life course (“*exercise program*”) selected by a user:

Terrain characteristic data is stored in the table files 56 on the media 20 (FIG. 3), along with the times at which they occur throughout the course (*i.e.*, related to a position in the video file 52). **Upon starting a course in the media 20, the table files 56 are loaded into temporary storage in the computer system 16.** And the lookup table 76 is created. Terrain characteristic changes may then be loaded into a linked list 80 (as depicted in FIG. 8) or accessed directly from the lookup table 76 (FIG. 7). At specified time intervals the terrain characteristic data is accessed and the terrain characteristic information which corresponds with that time is loaded. In response to the terrain characteristic information, a resistance is calculated and transmitted to the M-S converter 14, which provides appropriate control for the resistance system 22 of the exercise equipment 12. In this manner, the terrain characteristic data representing the actual terrain of the real-world course being viewed is used to automatically further vary settings of the resistance system 22, thereby applying a dynamic difficulty level.

Ex. 1005, 13:7-13:25; *see also id.*, 8:53-56 (“multiple unrelated courses may be stored on one physical storage unit.”).

268. Studor states that the real life course program is stored on media 20 on a server computer in computer system 16 (“*communication system*”). Studor states that the “users located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server, perhaps actually located on yet another continent.” Ex. 1005, 8:23-37.

269. Thus, Studor discloses “*an exercise device for enabling one or more users to select and perform an exercise program stored on a communication system, the exercise device comprising*” as recited in the preamble.

[78.1] an exercise mechanism comprising a movable element for movement in performance of exercise by a user, the exercise mechanism being configured to enable a user to exercise in response to an exercise program selected from one or more exercise programs stored on a remote communication system in network communication with the exercise mechanism; and

270. First, Studor teaches “an exercise mechanism comprising a movable element for movement in performance of exercise by a user.” *See* Ground 2 Limitations [1.1]/[29.1], and [49.1].

271. Second, Studor further discloses that the exercise mechanism (the bike) is configured to enable a user to exercise in response to an exercise program selected from one or more exercise programs. Studor explains that “longer **courses**, and even **multiple unrelated courses** may be stored on one physical storage unit.” Ex. 1005, 8:53-58; *see also id.*, 9:9-10 (“the exercise system 10 uses actual

captured video of real-world courses.”); *id.*, 10:4-8 (“*many real world courses* had variations in slope”).

272. Third, Studor teaches that the real life course program (“*exercise program*”) is stored on media 20 hosted by a server computer in computer system 16 (“*remote communication system*”). See Ground Limitation [78.0].

273. Fourth, Studor teaches that the exercise programs are stored on “a remote communication system in network communication with the exercise mechanism.”

274. Studor discloses a server computer (“a remote communication system”) which may host the media 20 connected to the local exercise system 10 over the Internet (comprising “in network communication with the exercise mechanism”):

Emerging technology is continually remolding the definition of what is a computer system, and the present exercise system 10 is quite able to employ such evolving technology to advantage. It should particularly be noted that not all components of the computer system 16 need to be physically present in one “box,” or even at one location. Computer networking, and particularly the Internet, are today broadening computer capabilities considerably. The exercise system 10 may also use such technology. **For example, users located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a**

server computer, perhaps actually located on yet another continent, to hold “communal” exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.

Ex. 1005, 8:24-38.

275. Thus, Studor discloses “*an exercise mechanism comprising a movable element for movement in performance of exercise by a user, the exercise mechanism being configured to enable a user to exercise in response to an exercise program selected from one or more exercise programs stored on a remote communication system in network communication with the exercise mechanism*” as recited in the claim.

[78.2] control means, communicating with the exercise mechanism, for receiving one or more packetized control signals from the remote communication system indicative of the selected exercise program and for changing one or more operating parameters of the exercise mechanism based upon the selected exercise program and the one or more packetized control signals.

276. Studor discloses “*control means, communicating with the exercise mechanism, for receiving one or more packetized control signals from the remote communication system ... and for changing one or more operating parameters of the exercise mechanism.*” See Ground 1 Limitations [1.4]/[29.4], and [49.5].

277. Studor further teaches that the terrain characteristics data from media 20 (“*packetized control signals*”) corresponds with a real life course (“*indicative of the selected exercise program*”). Ex. 1005, 8:53-58 (“longer **courses**, and even

multiple unrelated courses may be stored on one physical storage unit”), 9:9-10 (“the exercise system 10 uses actual captured video of real-world courses.”), 10:4-8 (“**many real world courses** had variations in slope”).

278. Studor also teaches that the changes to the resistance of exercise equipment 12 (“*operating parameters of exercise mechanism*”) is based on the selected terrain characteristics data (“*based upon the selected exercise program and the one or more packetized control signals*”). Ex. 1005, 13:18-25 (“In response to the terrain characteristic information, a resistance is calculated and transmitted to the M-S converter 14, which provides appropriate control for the resistance system 22 of the exercise equipment 12.”), 11:38-42 (“[T]he M-S converter 14 is able to **controllably adjust** the resistance system 22 on the exercise equipment 12 as a function of the speed data received and the parameters contained in course information (*i.e.*, **terrain characteristics**; *see e.g.*, FIGS. 7 and 8) which are stored on the media 20.”).

279. Thus, Studor renders obvious “*control means, communicating with the exercise mechanism, for receiving one or more packetized control signals from the remote communication system indicative of the selected exercise program and for changing one or more operating parameters of the exercise mechanism based upon the selected exercise program and the one or more packetized control signals*” as recited in the claim.

* * *

280. Given the above, Claim 78 is rendered obvious over Studor.

G. Claim Dependent on Claim 78

1. Claim 79

[79] An exercise device as recited in claim 78, wherein the selected exercise signals comprise at least one audio signal and at least one video signal

281. Studor discloses this limitation. See Ground 1 Claims [3] and [4].

2. Claim 80

[80] An exercise device as recited in claim 78, wherein the communication system comprises one or more storage devices adapted to store the one or more exercise programs.

282. Studor discloses this limitation. See Ground 1 Claim [16].

3. Claim 81

[81] An exercise device as recited in claim 78, wherein the network is selected from the group consisting of a local area network, a wide area network, and the Internet.

283. Studor renders obvious this limitation. See Ground 1 Claim [57].

4. Claim 82

[82] An exercise device as recited in claim 78, wherein the exercise mechanism includes one or more actuators configured to vary one or more operating parameters of the exercise mechanism.

284. Studor expressly states that “resistance systems 22,” which set the resistance for the brake, “are *typically controlled by motor-driven actuators*, and many are able to provide feedback indicating the current brake setting.” Ex. 1005,

4:52-64. The resistance is the operating parameter taught by Studor. *See* Ground 1 Limitations [1.4]/[29.4], [49.5], and [78.2].

285. Thus, Studor discloses “*the exercise mechanism includes one or more actuators configured to vary one or more operating parameters of the exercise mechanism*” as recited in the claim.

5. Claim 83

[83] An exercise device as recited in claim 78, wherein the control means comprises at least one decoder configured to decode the one or more packetized control signal and at least one processor configured to activate the one or more actuators in response so [sic] the one or more decoded control signals.

286. First, Studor teaches a micro controller 28 in M-S converter that can condition the terrain characteristics data (“*packetized control signal*”). Ex. 1005, 5:21-25 (“In the preferred embodiment (*see e.g.*, FIG. 2), the M-S converter 14 includes a **micro controller 28** (*e.g.*, a Motorola® MC68HC11) with integrated analog-to-digital capability, internal data communication capability, and sufficient memory for its role.”), 5:18-19 (“The M-S converter 14 also includes circuitry to perform signal-conditioning.”). Although Studor does not explicitly use the words “decoder,” a POSITA would have understood that micro controller 28 in M-S converter 14 is or includes a decoder to decode the terrain characteristics data, which is a digital signal since it is sent over the network, to provide signals required for controlling motors, which typically require variable current or voltage to

control the speed or incline. Ex. 1005, 5:15-16 (“The M-S converter 14 includes circuitry to drive commonly used resistance system 22”), 13:18-25 (“In response to the terrain characteristic information, a resistance is calculated and transmitted to the M-S converter 14, which provides appropriate control for the resistance system 22 of the exercise equipment 12.”). Otherwise, M-S converter 14 would be unable to use the terrain characteristics data transmitted in the packets as digital values to control the motors directly.

287. Second, computer system 16 “transmits control data through the communications link 26 to the M-S converter 14 for the dynamic control of the resistance system 22.” Ex. 1005, 11:5-16. The resistance system 22 is “typically controller by motor-driven actuators,” and as such, the micro controller 28 in the M-S converter 14 (“processor”) activates the actuators of resistance system 22 in response to the decoded terrain characteristics data. Ex. 1005, 4:62-63. Thus, Studor teaches at least one processor configured to activate the one or more actuators in response to the one or more decoded control signals.

288. Thus, Studor renders obvious at least one processor configured to activate the one or more actuators in response to the one or more decoded control signals.

289. Therefore, Studor renders obvious “*the control means comprises at least one decoder configured to decode the one or more packetized control signal*”

and at least one processor configured to activate the one or more actuators in response so [sic] the one or more decoded control signals,” as recited by the claim.

6. Claim 84

[84] An exercise device as recited in claim 78, wherein the communication system comprises:

290. Studor teaches server computer hosting media 20 in computer system 16 (“communication system”). See Ground 1 Limitation [78.1].

[84.1] (a) one or more storage devices adapted to store the one or more audio and video signals;

291. Studor discloses “one or more storage devices adapted to store the one or more audio and video signals.” See Ground 1 Claim [16], [80].

[84.2] (b) a control signal generator configured to generate one or more control signals; and

292. Studor teaches that software program 18 on the server computer in computer system 16 (“control signal generator”) “transmits control data through the communications link 26 to the M-S converter 14 for the dynamic control of the resistance system 22.” Ex. 1005, 11:5-16. Specifically, software program 19 on the server computer in computer system 16 generates the terrain characteristics data (“control signals”) to send to M-S converter 14. Ex. 1005, 11:38-42 (“the M-S converter 14 is able to controllably adjust the resistance system 22 on the exercise equipment 12 as a function of the speed data received and the parameters contained in course information (*i.e.*, terrain characteristics; *see e.g.*, FIGS. 7 and 8) which

are stored on the media 20.”), 13:18-25 (“In response to the terrain characteristic information, a resistance is calculated and transmitted to the M-S converter 14, which provides appropriate control for the resistance system 22 of the exercise equipment 12.”).

293. Thus, Studor discloses “*a control signal generator configured to generate one or more control signals*” as recited in the claim.

[84.3] (c) a control processor configured to synchronize and packetize the controls signals with the one or more audio and video signals and deliver the packetized control signal to the exercise mechanism.

294. First, Studor teaches that the computer system 16 contains a processor, such as a “Pentium 100 Mhz central processing unit” or “the PowerPC processor.” Ex. 1005, 6:11-24. A POSITA would understand that the Studor’s processor is used to process the “terrain characteristics for a course” together with the “table files 56” to “create a lookup table 76” that “correlate normalized terrain characteristic values with the relative time that the characteristic value was collected.” Ex. 1005, 12:45-54.

295. Second, Studor teaches that the control processor is configured to synchronize the control signals with the one or more audio and video signals. *See* Ground 1 Claim [4]. Studor also teaches that the control processor is configured to packetize the control signals. *See* Ground 1 Limitations [1.3]/[29.3].

296. Therefore, Studor discloses “*a control processor configured to synchronize and packetize the controls signals with the one or more audio and video signals and deliver the packetized control signal to the exercise mechanism*” as recited by the claim.

H. Independent Claim 85

[85.0] An exercise system comprising:

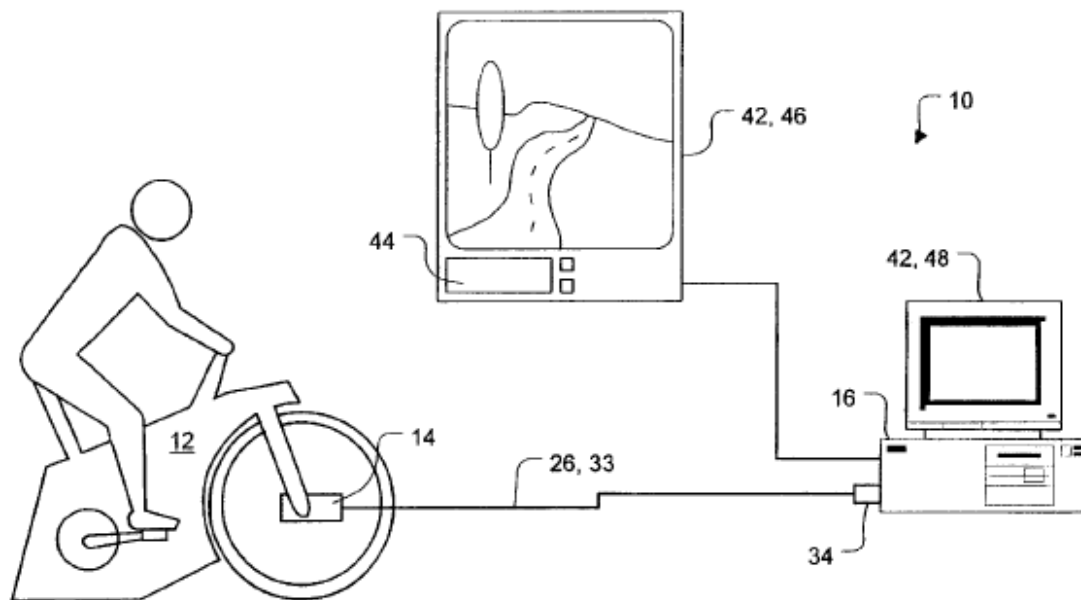
297. Studor teaches an “*exercise system*” describing exercise system 10:

As depicted in FIG. 1, **the exercise system 10 may be viewed as including the following major components: exercise equipment 12, which is suitably featured or modified; a M-S converter 14, which acquires data from and controls some aspects of the operation of the exercise equipment 12;** and a computer system 16, which uses a software program 18 and pre-recorded media 20, to operate the exercisesystem 10 and present to the user the simulation of a real-world exercise experience.

Ex. 1005, 4:28-37.

298. Studor teaches that the exercise system includes exercise equipment such as a “bicycle” and notes that “treadmills, stairsteppers, rowing machines, ski machines, and other equipment are equally suitable.” Ex. 1005, 4:43-45. The exercise bicycle may include an “adjustable resistance system 22” to provide

variable resistance to the pedals (*i.e.*, movable element) of the bicycle. Ex. 1005, 4:48. Studor's exemplar local system is depicted in Fig. 1, below:



Ex. 1005, Fig. 1

299. Furthermore, Studor discloses a server computer (“*remote system including at least one remote computer*”) which hosts the media 20 and communicates with the exercise equipment 12 through M-S converter 14 and a local network computer in computer system 16 (“*local system*”) over the Internet (“*communication link*”):

Emerging technology is continually remolding the definition of what is a computer system, and the present exercise system 10 is quite able to employ such evolving technology to advantage. It should particularly be noted that not all components of the computer system

16 need to be physically present in one “box,” or even at one location. Computer networking, and particularly the Internet, are today broadening computer capabilities considerably. The exercise system 10 may also use such technology. **For example, users located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent**, to hold “communal” exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.

Ex. 1005, 8:24-38, 15:43-45 (“[B]icyclists training for the Tour d’France race can ‘compete’ with others similarly minded, or friends may take social rides through simulated creations of scenic Irish countryside. The exercise equipment 12 used for these examples need not even be in the same country. They may be part of a global implementation of the computer system 16 which is connected over a network like the Internet”).

300. Thus, Studor discloses an “*exercise system*” as recited in the preamble, and discussed in more detail below.

[85.1] (a) a local system including at least one exercise apparatus to an associated local computer;

301. Studor teaches a “*local system*” that includes exercise equipment 12 (“*at least one exercise apparatus*”) with M-S converter 14 including a micro

controller 28 (“*local computer*”) and local network computer in computer system 16.

302. The exercise system 10 includes three major components: exercise equipment 12, M-S converter 14 “which acquires data from and controls some aspects of the operation of the exercise equipment 12,” and computer system 16 “which uses a software program 18 and pre-recorded media 20, to operate the exercise system 10 and present to the user the simulation of a real-world exercise experience.” Ex. 1005, 4:28-37.

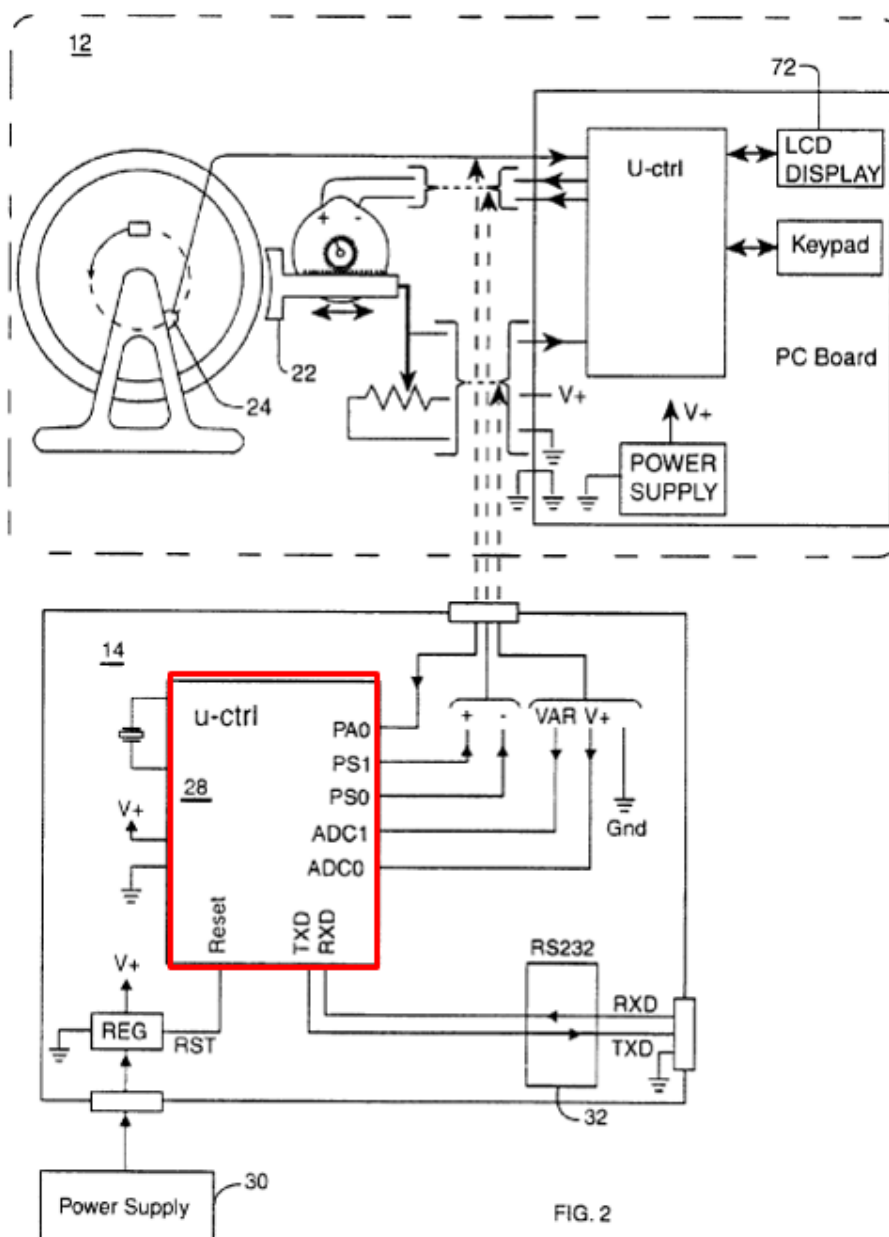
303. M-S converter 14 performs two major tasks: “One is to receive commands from the computer system 16 to control the resistance system 22 of the exercise equipment 12, and the other is to acquire data from the speed sensor 24 of the exercise equipment 12, to convert that data as needed, and to then transmit it through a communications link 16 to the computer system 16.” Ex. 1005, 5:4-9.

304. To perform those tasks, M-S converter 14 includes a computer, specifically micro controller 28:

The M-S converter 14 also includes circuitry to perform signal-conditioning and to communication with the computer system 16, via the communications link 26. In the preferred embodiment (*see e.g.*, FIG. 2), the M-S converter 14 includes a **micro controller 28** (*e.g.*, a Motorola® MC68HC11) with integrated analog-to-digital capability,

internal data communication capability, and sufficient memory for its role.

Ex. 1005, 5:18-24.



Ex. 1005, Fig. 2 (annotated)

305. Micro controller 28 and a network-connected computer in computer system 16 is a “*local computer*.” Micro controller 28 is integrated into exercise equipment 12 as part of M-S converter 14. Studor explains “**M-S converter 14 may be either integrated into the exercise equipment 12** by the original equipment manufacturer (OEM), or it may also be retrofitted to existing exercise equipment.” Ex. 1005, 5:9-14.

306. Studor also explains that the location of computer system 16 is flexible, noting that “not all components of the computer system 16 need to be physically present in one ‘box, or even one location.” Ex. 1005, 8:26-28. Computer system 16 may include a “network computer or network terminal.” Ex. 1005, 6:49-55. Studor teaches that distributing computer system 16 allows “users located on different continents [to] employ the exercise system 10 with Internet connected network computers (NC).” Ex. 1005, 8:23-28.

307. Thus, a POSITA would understand that when networked as Studor describes, the exercise system 10 includes a local network computer in computer system 16 (a part of the “*local system*”) in addition to a server computer in computer system 16 (a part of the “*remote system*” as further discussed below.

308. Thus, Studor discloses “*a remote system including a least one remote computer*” as recited in the claim.

[85.2] (b) a remote system including a least one remote computer; and

309. Studor teaches part of computer system 16 (“*remote system*”) including the server computer hosting media 20 (“*at least one remote computer*”).

310. Studor explains that “not all components of the computer system 16 need to be physically present in one ‘box,’ or even at one location.” Ex. 1005, 8:27-

29. Studor discusses the ability to implement exercise system 10 globally:

[B]icyclists training for the Tour d’France race can ‘compete’ with others similarly minded, or friends may take social rides through simulated creations of scenic Irish countryside. The exercise equipment 12 used for these examples **need not even be in the same country**. They may be part of a global implementation of the computer system 16 which is connected over a network like the Internet.

Ex. 1005, 15:43-45.

311. As such, Studor recognizes that “exercise system 10 with Internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold ‘communal’ exercise sessions in concert.” Ex. 1005, 8:32-38. Therefore, Studor’s “server computer” hosting media 20 “on yet another continent” is a “remote system including at least one remote computer.”

312. Thus, Studor discloses “*a remote system including a least one remote computer*” as recited in the claim.

[85.3] (c) a communication link for communicating packetized data between the local computer and the remote system, such that the local system may receive remote system data from the remote system, including packetized control signals for controlling operation of the at least one exercise apparatus.

313. **First**, Studor teaches that communication link 26 implemented as an Internet connection (“*communication link*”) is for communicating data, such as control signals in the form of terrain characteristic data (“*packetized data*”), between the micro controller 28 of M-S converter 14 (“*local computer*”) and the server computer hosting media 20 in computer system 16 (“*remote system*”).

314. Studor explains that “[t]he communication link 26 is bi-directional for communications between the computer system 16 and the M-S converter 14.” Ex. 1005, 5:33-35. The communication link 26 can “transfer data via other means ... rather than use the presently preferred serial data transfer protocol.” Ex. 1005, 5:59-61. A POSITA would understand that the communication link 26 can be implemented as an Internet connection. Ex. 1005, 15:43-45 (“a global implementation of the computer system 16 [] is connected over a network like the Internet”).

315. In particular, Studor teaches that local system can receive media 20 over a network like the Internet so that multiple users can participate in the same exercise course:

Emerging technology is continually remolding the definition of what is a computer system, and the present exercise system 10 is quite able to employ such evolving technology to advantage. It should particularly be noted that not all components of the computer system 16 need to be physically present in one “box,” or even at one location.

Computer networking, and particularly the Internet, are today broadening computer capabilities considerably. The exercise system 10 may also use such technology. For example, users located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold “communal” exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.

Ex. 1005, 8:23-37, *see also* 16:53-62 (“A key point of consumer interest for the exercise system 10 is the variety possible in the media 20. Users of the invention could, via simulation, bicycle the Pacific Coast highway in California one day, and trek in the Pyrenees mountains of northern Spain the next. **The media 20 of different course profiles could be** distributed by video rental companies, **transferred from a proprietary health club video server on a network,** obtained via the Internet using an interactive television, or even transmitted using digital satellite.”).

316. **Second**, Studor teaches “*the local system may receive remote system data from the remote system, including packetized control signals for controlling*

operation of the at least one exercise apparatus.” See Ground 1 Limitations [1.3]/[29.3], and [49.3].

317. Thus, Studor renders obvious “*a communication link for communicating packetized data between the local computer and the remote system, such that the local system may receive remote system data from the remote system, including packetized control signals for controlling operation of the at least one exercise apparatus*” as recited in the claim.

* * *

318. Given the above, Claim 85 is obvious over Studor.

I. Claims Dependent on Claim 85

1. Claim 87

[87.1] An exercise system as recited and claim 85, wherein the one or more control signals correspond to an exercise program selected by a user of the least one exercise apparatus.

319. Studor discloses that the terrain characteristic data (“*control signals*”) correspond to an exercise program selected by a user of the exercise equipment 12 (“*exercise apparatus*”). See Ground 1 Limitations [1.2]/[29.2], [1.3]/[29.3], [49.2], [49.3], [78.1], and [78.2].

320. Studor teaches that the terrain characteristics data corresponds with a real life course (“*exercise program*”) selected by a user:

Terrain characteristic data is stored in the table files 56 on the media 20 (FIG. 3), along with the times at which they occur throughout the course (*i.e.*, related to a position in the video file 52). Upon starting a course in the media 20, the table files 56 are loaded into temporary storage in the computer system 16. And the lookup table 76 is created. Terrain characteristic changes may then be loaded into a linked list 80 (as depicted in FIG. 8) or accessed directly from the lookup table 76 (FIG. 7). At specified time intervals the terrain characteristic data is accessed and the terrain characteristic information which corresponds with that time is loaded. In response to the terrain characteristic information, a resistance is calculated and transmitted to the M-S converter 14, which provides appropriate control for the resistance system 22 of the exercise equipment 12. **In this manner, the terrain characteristic data representing the actual terrain of the real-world course being viewed is used to automatically further vary settings of the resistance system 22, thereby applying a dynamic difficulty level.**

Ex. 1005, 13:7-13:25.

321. Thus, Studor discloses “*wherein the one or more control signals correspond to an exercise program selected by a user of the least one exercise apparatus*” as recited in the claim.

2. Claim 89

[89.1] An exercise system as recited in claim 85, wherein the remote system remotely controls an operation of the local computer based upon the packetized control signals.

322. Studor discloses that the media 20 on a server (“*remote system*”) remotely controls the signals sent by computer system 16 and the micro controller 28 in M-S converter 14 (“*local computer*”) to adjust the resistance system 22 based upon the terrain characteristic data (“*packetized control signals*”).

323. **First**, Studor teaches that the micro controller 28 in M-S converter 14 can control resistance system 22:

The M-S converter 14 includes circuitry to drive commonly used resistance systems 22, and to receive information from commonly used speed sensors 24 (some examples of both have been noted above). The M-S converter 14 also includes circuitry to perform signal-conditioning and to communicate with the computer system 16, via the communications link 26. In the preferred embodiment (*see e.g.*, FIG. 2), **the M-S converter 14 includes a micro controller 28 (e.g., a Motorola® MC68HC11)** with integrated analog-to-digital capability, internal data communication capability, and sufficient memory for its role. A suitable external power supply 30 is chosen to meet the demands from the hardware of the M-S converter 14, as is circuitry to condition the signals coming from and going to the exercise equipment 12. A RS-232 Receiver/Transmitter integrated circuit (IC) communications port 32 interfaces the micro controller 28 to the communications link 26, and in turn to the computer system 16.

Ex. 1005, 5:15-32.

324. A POSITA would understand that the micro controller 28 is the part of M-S converter 14 that processes data and sends control signals to the resistance system 22. The processor or controller in a computer is like the brain of a device.

325. **Second**, Studor teaches that media 20 on a server (*“remote system”*) remotely controls the exercise equipment 12 through computer system 16 and the micro controller 28 of M-S converter 14 based upon the terrain characteristics data (*“packetized control signals”*).

326. In particular, Studor teaches that one of the main tasks of the M-S converter 14 “is to receive commands from computer system 16 to control the resistance system 22 of the exercise equipment 12.” Ex. 1005, 5:5-7. As Studor explains, the “computer system reads media containing previously recorded course data, and based upon the speed data from the exercise machine and the pre-stored course data, calculates and appropriately directs the controller to dynamically control the resistance of the exercise machine so that varying degrees of difficulty are simulated as a user operates the exercise machine, as would be consistent with what would be experience traveling through a real exercise course.” Ex. 1005, 3:9-22.

327. The computer system 16 controls the micro controller 28 of M-S converter 14 by sending the terrain characteristics data (*“packetized control signals”*) to simulate the course:

In the preferred embodiment, the software program 18 employs a model time based process where the software program 18 computes speed and position within the present exercise course at roughly 60 ms intervals. The M-S converter 14 feeds data to the software program 18 asynchronously. The terrain data corresponding to the current “position” in the exercise course is then fetched and processed and the process adjusts the video playback rate to synchronize the video position with the virtual position of the user within the exercise course. This model time based process is interrupted by the arrival of new speed data, and runs an extra cycle to re-compute speed and position when new speed data from the M-S converter 14 arrives. Therefore, in the preferred embodiment the M-S converter 14 transmits such speed data at a rate of up to once every 60 ms, with more frequent transmissions improving the smoothness of the computations, and the process directs setting the resistance system 22 each time such a reporting from the speed sensor 24 is received. The resistance level desired is computed as the time average of the power levels that the model time based process calculates between each speed report. In this manner the M-S converter 14 is able to controllably adjust the resistance system 22 on the exercise equipment 12 as a function of the speed data received and the parameters contained in course information (i.e., terrain characteristics; see e.g., FIGS. 7 and 8) which are stored on the media 20. However, the synchronization rate used for video playback is somewhat complicated by the fact that the video timing is variable and need not necessarily correlate with real time. The inventors have

addressed this by transmitting control data for the resistance system 22 once for every second of video time, and by omitting any such control data for any corresponding video “seconds” which are skipped. In this manner the software program 18 maintains correct alignment between the video playback and the difficulty feedback the user experiences from the resistance system 22. Value added features such as terrain characteristic graphs and the user’s relative course location can also easily be provided, in pop-up windows on a television 46 used as monitor 25 or on a separate computer monitor 48.

Ex. 1005, 11:17-56.

328. Moreover, Studor teaches hosting media 20 on a server (“remote system”). Ex. 1005, 8:23-37. Media 20 contains the terrain characteristic data that control an operation of the rest of computer system 16 and the micro controller 28 of M-S converter 18.

329. The media 20 used with the exercise system 10 are produced by acquiring position and terrain characteristics for real-world courses for the table files 56.” Ex. 1005, 9:54-56. The terrain characteristic data are control signals because they are used to determine the resistance level: “the M-S converter 14 is able to controllably adjust the resistance system 22 on the exercise equipment 12 as a function of the speed data received and the parameters contained in course information (*i.e.*, terrain characteristics; *see e.g.*, FIGS. 7 and 8) which are stored

on the media 20.” Ex. 1005, 11:38-42. Therefore, the media 20 sent by the network server remote controls an operation (setting the resistance) of the local computer based upon the packetized control signals.

330. Thus, Studor discloses “*the remote system remotely controls an operation of the local computer based upon the packetized control signals*” as recited in the claim.

3. Claim 90

[90.1] An exercise system as recited in claim 85, further comprising one or more input devices gathering a signal from a user of the at least one exercise apparatus, the one or more input devices being selected from a group consisting of audio and video.

331. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 64-65. I have been instructed by counsel to interpret “consisting of” the same way.

332. Studor teaches that the exercise system 10 can include input devices that allow the user to interact with other users through video conferencing, such that the input devices would gather an audio and video signal from the user. The input devices would be selected from microphones (“*audio input devices*”) or camera (“*video input devices*”) that would enable the video conference capabilities.

333. Studor explains that computer system 16 may include common video conferencing capability:

Of course, separated multiple users of the exercise system 10 in situations like those described above might want to communicate with and actively perceive each other. **This is possible with realistic audio and even visual communication over networks in the computer system 16, using increasingly common technology (e.g., by incorporating “video conferencing” type capability into the exercise system 10).**

Ex. 1005, 15:47-53.

334. A POSITA would have understood that a system implementing common video conferencing capability would require an audio input device, such as a microphone, and a video input device, such as a camera. Studor recognizes that video cameras were available at the time, noting that a camera to record video in real-time in another part of the system:

One method used by the inventors to concurrently collect slope terrain data and video data for cycling has been to record the known overall distance of a course; record the video in real-time using a firewire connection between the video camera and a PC logging the data; and varying travel speed in accordance with a normalized data set derived from empirical data collected from the speed of an actual cyclist in accordance with the slope terrain, *i.e.* 6 degree slope=8 MPH and a zero degree slope=20 MPH, etc. In this manner, speed of travel and slope data can be synchronized (in real-time) with digital video, and concurrently recorded slope time

intervals can be made equally divisible with digital or analog video frame per second rates.

Ex. 1005, 10:15-57.

335. The inclusion of audio and video input devices to implement the video conferencing capability discussed in Studor was well within the knowledge of a POSITA at the relevant time. For example, U.S. Patent No. 6,430,997 (“French”) described using “cameras or other image capturing devices” to capture images of an exerciser so that an image analysis can be performed. Ex. 1015, 10:46-53. Similarly, U.S. Patent No. 5,785,630 (“Bobick”) explained that “a microphone can be electrically coupled to the computer and located in/on the computer, in/on the display(s), or elsewhere on the exercise machine” to “allow for both voice and data communication between the users.” Ex. 1008, 15:4-11.

336. To the extent “consisting of” is a so-called “closed group,” Studor renders this limitation obvious. It would have been obvious to a POSITA to choose only audio and video input devices. Audio and video input devices were part of a finite number of possible choices that a POSITA would have chosen. A POSITA would have had good reason to try audio and video input devices and would have been a matter of design choice.

337. Thus, Studor renders obvious “*wherein the at least one user interface device is selected from the group consisting of one or more audio input devices and one or more video input devices*” as recited in the claim.

4. Claim 92

[92.1] An exercise system as recited in claim 85, wherein the packetized control signals are synchronized with at least one of an audio signal or a video signal.

338. Studor discloses that the terrain characteristics data (“*packetized control signals*”) are synchronized with at least a video signal of the terrain data or optionally with an audio signal of sound content. *See* Ground Claim [4].

339. Studor explains that one of the “advantages of the invention is that it realistically simulates a real world exercise experience.” Ex. 1005, 3:31-32. To simulate a real world experience, “[t]rue nature video content is used, which is captured in natural settings along real world courses, rather than computer animations and graphics.” Ex. 1005, 3:32-35. The video can also be supplemented by audio: “The user may optionally select that natural sound content be added to the experience, or may opt for verbal feedback and encouragement, or for music to set a mood or to entertain.” Ex. 1005, 3:36-38.

340. To simulate a real world experience, Studor teaches that when the terrain characteristic data is captured, video of the terrain can also be captured so

that “speed of travel and slope data can be synchronized (in real-time) with digital video”:

One method used by the inventors to concurrently collect slope terrain data and video data for cycling has been to record the known overall distance of a course; record the video in real-time using a firewire connection between the video camera and a PC logging the data; and varying travel speed in accordance with a normalized data set derived from empirical data collected from the speed of an actual cyclist in accordance with the slope terrain, *i.e.* 6 degree slope=8 MPH and a zero degree slope=20 MPH, etc. **In this manner, speed of travel and slope data can be synchronized (in real-time) with digital video,** and concurrently recorded slope time intervals can be made equally divisible with digital or analog video frame per second rates.

Ex. 1005, 10:45-57.

341. Studor consistently teaches that the terrain characteristic data should be synchronized with audio and video data (“*an audio signals*” and “*a video signal*”):

The media 20 used with the exercise system 10 are produced by acquiring position and terrain characteristics for real-world courses for the table files 56, by acquiring video data for the video files 52 which is representative of a human viewer’s perspective as they would travel through the course, and by acquiring audio data for the audio files 54 (*e.g.*, by dubbing in voice overs and music soundtracks or natural environment sounds to match the acquired

terrain and video data), **and by storing all of these along with synchronizing information in the media 20. This generalized approach of mapping normalized terrain characteristic data facilitates the creation of new video environments.** The terrain characteristic data is simultaneously collected with the video data using a time interval which ensures that changes in terrain characteristic seems smooth and continuous to the user.

Ex. 1005, 9:54-10:2.

In the preferred embodiment, the software program 18 employs a model time based process where the software program 18 computes speed and position within the present exercise course at roughly 60 ms intervals. The M-S converter 14 feeds data to the software program 18 asynchronously. **The terrain data corresponding to the current “position” in the exercise course is then fetched and processed and the process adjusts the video playback rate to synchronize the video position with the virtual position of the user within the exercise course.** This model time based process is interrupted by the arrival of new speed data, and runs an extra cycle to re-compute speed and position when new speed data from the M-S converter 14 arrives. Therefore, in the preferred embodiment the M-S converter 14 transmits such speed data at a rate of up to once every 60 ms, with more frequent transmissions improving the smoothness of the computations, and the process directs setting the resistance system 22 each time such a reporting from the speed sensor 24 is received. The resistance level desired is computed as the time average of the power

levels that the model time based process calculates between each speed report. In this manner the M-S converter 14 is able to controllably adjust the resistance system 22 on the exercise equipment 12 as a function of the speed data received and the parameters contained in course information (*i.e.*, terrain characteristics; *see e.g.*, FIGS. 7 and 8) which are stored on the media 20. **However, the synchronization rate used for video playback is somewhat complicated by the fact that the video timing is variable and need not necessarily correlate with real time.** The inventors have addressed this by transmitting control data for the resistance system 22 once for every second of video time, and by omitting any such control data for any corresponding video “seconds” which are skipped. **In this manner the software program 18 maintains correct alignment between the video playback and the difficulty feedback the user experiences from the resistance system 22.** Value added features such as terrain characteristic graphs and the user’s relative course location can also easily be provided, in pop-up windows on a television 46 used as monitor 25 or on a separate computer monitor 48.

Ex. 1005, 11:17-56.

342. Thus, Studor discloses “*the packetized control signals are synchronized with at least one of an audio signal or a video signal*” as recited in the claim.

5. Claim 93

[93.1] An exercise system as recited in claim 85, wherein the communication link comprises a network connection.

343. Studor discloses that the connection between computer system 16 and the server hosting media 20 (“*communication link*”) can be a network connection, like a connection to the Internet. *See* Ground 1 Limitation [85.4].

344. Studor teaches that a network computer in computer system 16 in the exercise system can receive media 20 over a network like the Internet so that multiple users can participate in the same exercise course:

Emerging technology is continually remolding the definition of what is a computer system, and the present exercise system 10 is quite able to employ such evolving technology to advantage. It should particularly be noted that not all components of the computer system 16 need to be physically present in one “box,” or even at one location. **Computer networking, and particularly the Internet, are today broadening computer capabilities considerably. The exercise system 10 may also use such technology. For example, users located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold “communal” exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.**

Ex. 1005, 8:23-37, *see also* 16:53-62 (“A key point of consumer interest for the exercise system 10 is the variety possible in the media 20. Users of the invention could, via simulation, bicycle the Pacific Coast highway in California one day, and trek in the Pyrenees mountains of northern Spain the next. **The media 20 of different course profiles could be distributed by video rental companies, transferred from a proprietary health club video server on a network, obtained via the Internet using an interactive television, or even transmitted using digital satellite.**”).

345. As explained above with respect to Limitation [85.3], the network interface of computer 16 would be “communicating with” the user interface of computer 16 to allow a user to interact with the server-based media over the network the same as if the media was stored on the device.

346. Studor teaches implementing exercise system 10 over a network connection because it allows users in a wide range of locations to exercise together:

Emerging technology is continually remolding the definition of what is a computer system, and the present exercise system 10 is quite able to employ such evolving technology to advantage. It should particularly be noted that not all components of the computer system 16 need to be physically present in one “box,” or even at one location. **Computer networking, and particularly the Internet, are today broadening computer capabilities considerably. The exercise**

system 10 may also use such technology. For example, users located on different continents may employ the exercise system 10 with Internet connected network computers (NC) and media 20 on a server computer, perhaps actually located on yet another continent, to hold “communal” exercise sessions in concert, for competitive sporting events, or for coached exercise regimes.

Alternately, the exercise system 10 may use one powerful computer system 16 to run exercise sessions for multiple users on multiple instances of exercise equipment 12. These sessions may be quite different, using entirely different data from the media 20, or they may be for exercise in concert or in competition. For example, a health club might employ the exercise system 10 with one computer system 16 to concurrently control a variety of exercise equipment 12 for its various individual member-users, all in manners suiting their individual tastes and capabilities.

Ex. 1005, 8:23-47.

The exercise system 10 can also enhance or change the social content of exercise. For example, now bicyclists training for the Tour d’France race can “compete” with others similarly minded, or friends may take social rides through simulated creations of scenic Irish countryside. The exercise equipment 12 used for these examples need not even be in the same country. They may be part of a global implementation of the computer system 16 which is connected over a network like the Internet.

Ex. 1005, 15:37-46.

347. Studor further explains that computer system 16 can be implemented using a “network computer” or “network terminal” and provide “realistic audio and even visual communication over networks in the computer system 16”:

Of course, separated multiple users of the exercise system 10 in situations like those described above might want to communicate with and actively perceive each other. **This is possible with realistic audio and even visual communication over networks in the computer system 16**, using increasingly common technology (e.g., by incorporating “video conferencing” type capability into the exercise system 10). Further, for such inter-user audio-visual communication, when realistic user portrayal is optional or even unwanted, user substitutes can be employed. Techniques for this can be borrowed from the field of computer gaming, where avatars are the virtual-world counterparts of the real-world players. Thus the exercise system 10 could permit a fat person “wearing” a thin avatar or an old person wearing a young avatar to exercise with less self consciousness. Similarly, runners could train together “incognito,” with only the individuals themselves actually knowing their respective genders and races.

Ex. 1005, 15:47-64.

The media player 36 may be of any type suitable for the particular media 20 employed (described below). It is anticipated that in many embodiments the media player 36 will be mounted in the computer

system 16 itself, but an external device may also be used (one very “external,” if the computer system 16 includes a network computer or network terminal, also discussed below). The present preferred embodiment uses CD-ROM type media 20, and accordingly the media player 36 used in the preferred embodiment may be a CD-ROM drive or a DVD drive (Universal Disk Format, also sometimes termed Digital Versatile Disk, a new high capacity format just now entering the market; the disk players for DVD can also read CD-ROM disks). As higher capacity media 20 become more widely available, higher quality video and longer workouts with more room for novel value added components may be incorporated into the media 20. Some examples include interactive coaching and multiple music tracks to chose [sic] from; say classical, rock, jazz, rap, vocal, environmental nature sounds, etc.

Ex. 1005, 6:49-6:67.

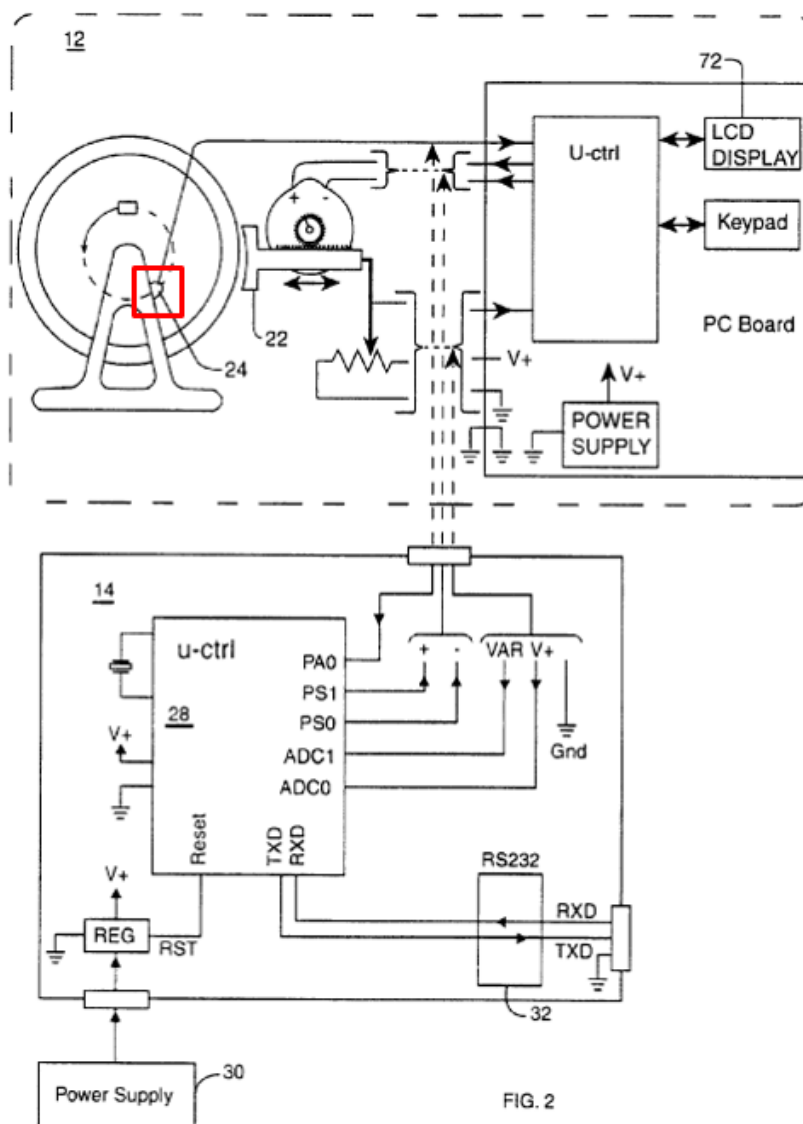
348. Thus, Studor discloses “*communication link comprises a network connection*” is recited in claim.

6. Claim 94

[94.1] An exercise system as recited in claim 85, wherein the exercise apparatus comprises one or more sensors for detecting data representative of the status of the exercise apparatus is configured to transmit the data to the remote system via the communication link.

349. **First**, Studor discloses that exercise equipment 12 includes a speed sensor 24 (“*one or more sensors*”) for detecting data representative of the status of exercise equipment 12 (“*exercise apparatus*”).

350. As shown below in Figure 2, speed sensor 24 is located by the flywheel of exercise equipment 12, and communicates with micro controller 28 of M-S Converter 14:

**Ex. 1005, Fig. 2 (annotated)**

351. The speed sensor 24 “provides data from which the user’s actual efforts can be inferred.” Ex. 1005, 4:49-51. M-S converter 14 “acquire[s] data from the speed sensor 24.” Ex. 1005, 5:7-8. “M-S converter 14 is able to controllably adjust the resistance system 22 on the exercise equipment 12 as a function of the

speed data received and the parameters contained in the course information (*i.e.*, terrain characteristics, *see e.g.*, FIGS 7 and 8).” Ex. 1005, 11:37-42.

352. Studor explains that speed sensors to sense the speed of exercise equipment is commonly available:

Various exercise equipment 12 on the market today comes with any of several suitable configurations of both speed sensors 24 and resistance systems 22. Alternately, such may easily be retro-fitted to many types of existing exercise equipment 12. **Some commonly available speed sensors 24 include reluctance, hall-effect, tachometer, and pulse creating alternator type devices.** Some commonly used resistance systems 22 are friction and magnetic braking devices (*e.g.*, electronically adjustable brakes using a motor or electromagnet system, and even brakes powered from an alternator used in the speed sensor 24). These are typically controlled by motor-driven actuators, and many are able to provide feedback indicating the current brake setting.

Ex. 1005, 4:52-64.

353. **Second**, speed sensor 24 is configured to transmit the data to the server computer in the computer system 16 (“*remote system*”) via the communication link 26 (“*communication link*”).

354. Studor explains that the data from speed sensor 24 is sent from M-S converter 14 via communication link 26 where it is eventually transmitted to the server computer in computer system 16:

The media 20 may also contain the software program 18, for loading into and execution on the computer system 16.

Ex. 1005, 9:34-35.

The software program 18 (FIG. 3) is used to perform the three conventional tasks of input, output and processing. **It accepts as input the data files 50 from the media 20, and also speed sensor 24 (an optional other sensors) data from the M-S converter 14 as it arrives via the communications link 26.** As output it plays back the video files 52 and the audio files 54 from the media 20 and it transmits control data through the communications link 26 to the M-S converter 14 for dynamic control of the resistance system 22, to correlate a user's performance on the exercise equipment 12 with the rate and manner in which contents of the media 20 are being played.

Ex. 1005, 11:5-16.

355. As explained above with respect to Limitation [85.2], the portion of the computer system 16 hosting media 20 on a server is the “remote system.” M-S converter 14 “acquire[s] data from the speed sensor 24 of the exercise equipment 12, to convert the data as needed, and to then transmit it through a communication link 26 to the computer system 16” including the server computer in computer

system 16.” Ex. 1005, 5:5-10. A POSITA would understand that this information is used by the server computer for “interactively controlling [exercise sessions], and for later summarizing and comparing sessions statistics.” Ex. 1005, 6:25-28. For example, a POSITA would recognize that Studor’s disclosure of “comparing session statistics” would be advantageous when implemented using a networked server, in particular when holding “‘communal’ exercise session in concert” or “competitive sporting events” involving multiple users in disparate locations. Ex. 1005, 8:23-37. “Comparing session statistics” would be useful to gauge the user’s relative performance, in particular for “competitive” events.

356. Thus, Studor discloses “*wherein the exercise apparatus comprises one or more sensors for detecting data representative of the status of the exercise apparatus is configured to transmit the data to the remote system via the communication link*” as recited in the claim.

7. Claim 95

[95.1] An exercise system as recited in claim 85, further comprising a safety mechanism in communication with the at least one exercise apparatus, the safety mechanism manipulating the at least one exercise apparatus in the event that a packetized control signal is interrupted.

357. Studor renders obvious “*a safety mechanism in communication with the at least one exercise apparatus, the safety mechanism manipulating the at least*

one exercise apparatus in the event that a packetized control signal is interrupted.”

See Ground 1 Claim 38.

IX. GROUND 2: THE CHALLENGED CLAIMS ARE OBVIOUS OVER CLEM IN VIEW OF THE KNOWLEDGE OF A PERSON OF ORDINARY SKILL IN THE ART OR HICKMAN

358. Below, I provide an analysis of how Clem in view of the knowledge of a person of ordinary skill in the art or Hickman renders obvious the Challenged Claims.

A. Summary of Clem

359. Like the '062 Patent, Clem relates to an exercise system. See Ex. 1012, Abstract. Clem notes that: “Modern fitness machines, or exercise machines, including treadmills, steppers, stationary bicycles, and the like are often electronically controlled to vary their resistance levels.” Ex. 1012, 1:10-12. “It [was] also known to use a stored program to increase the resistance within exercise equipment in order to increase the user heart rate and to decrease the resistance in order to decrease the heart rate accordingly.” Ex. 1012, 1:33-38.

360. Clem describes an exercise device with a “controller at the user location for controlling the exercise device” and provides “a control location remote from the user location and communication system for transmitting information between the exercise device and the control location.” Ex. 1012, 1:67-2:3. As an example, Clem describes a “treadmill” with a belt. Ex. 1012, 4:5-33

(treadmill having a continuous belt). The treadmill can vary the grade or incline as well as the speed of the belt through a controller. Ex. 1012, 4:25-33 (describing control of the drive motor via controller), 4:34-59 (describing control of incline motor via controller), 5:24-26 (controller determines speed and grade of fitness device).

361. Also, like the '062 Patent, Clem's exercise device has the ability to receive control signals remotely: "The control information transmitted from the web site 12 can include control signals for directly controlling the fitness device 32." Ex. 1012, 2:66-3:7.

362. In addition, Clem's exercise device includes a console which permits user input, including device information such as speed, incline, and suspension, as well as commands related to control programs. Ex. 1012, Fig. 3, 3:47-63 ("Device information such as speed, incline and suspension can also be communicated by the user or automatically by way of the internet system 19"); cl. 23 ("interactive interface ... wherein commands related to the database can be entered at the user location").

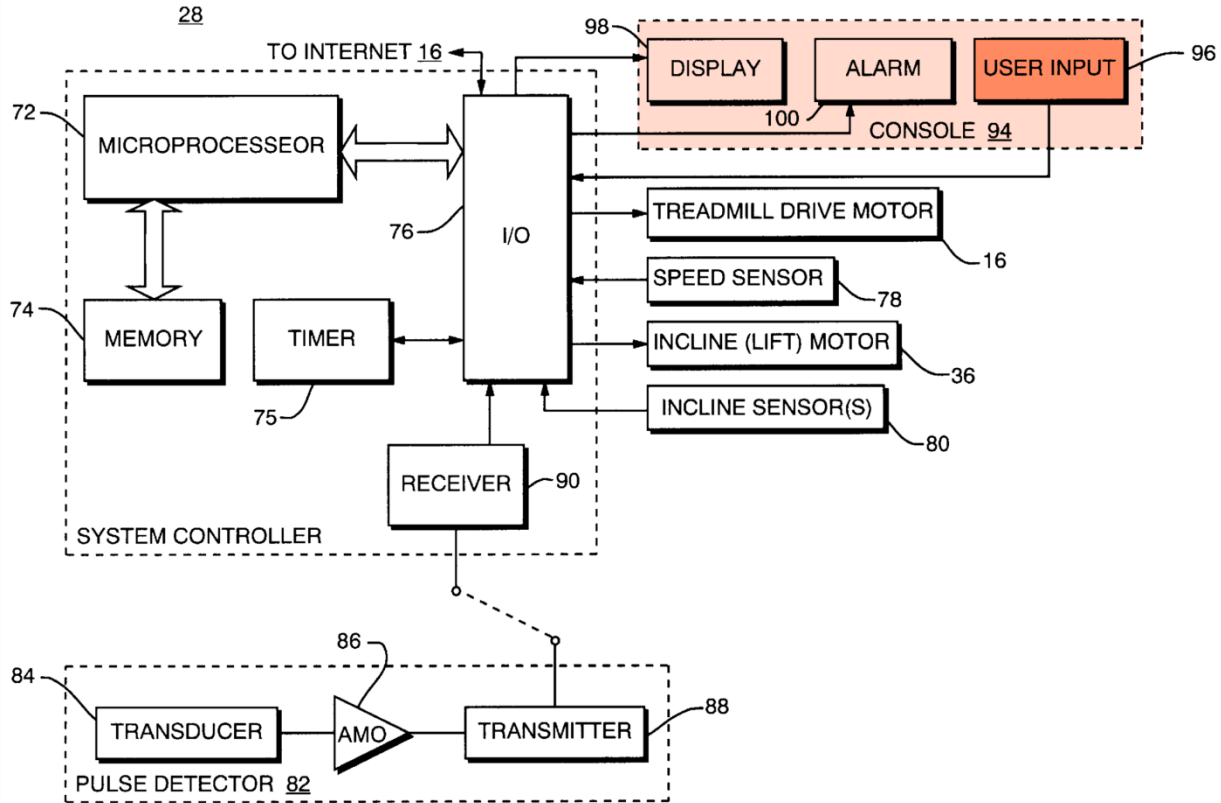


FIG. 3

Ex. 1012, Fig. 3 (annotated)

363. The console also includes a display, which receives signals from the microprocessor in the controller. Ex. 1012, 5:16-17.

364. Clem also describes that the user “can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication regarding matters related to fitness.” Ex. 1012, 2:53-57. The user can “interactively obtain control information from a computer located at the web site 12.” Ex. 1012, 2:60-64. The real-time communication can include “the uploading and downloading of video and audio information.” Ex. 1012, 2:64-65.

365. The real-time and interactive communications between the fitness expert at the web site and the display at the console occurs “by way of an internet system.” Ex. 1012, 2:36-38. The user location “interactively applies and receives the interactive information to the internet system 19 by way of network connection device 18.” Ex. 1012, 3:33-38. The fitness equipment interface couples the network connection device to the fitness device and sends information to and from the controller. Ex. 1012, Fig. 1, 3:22-23.

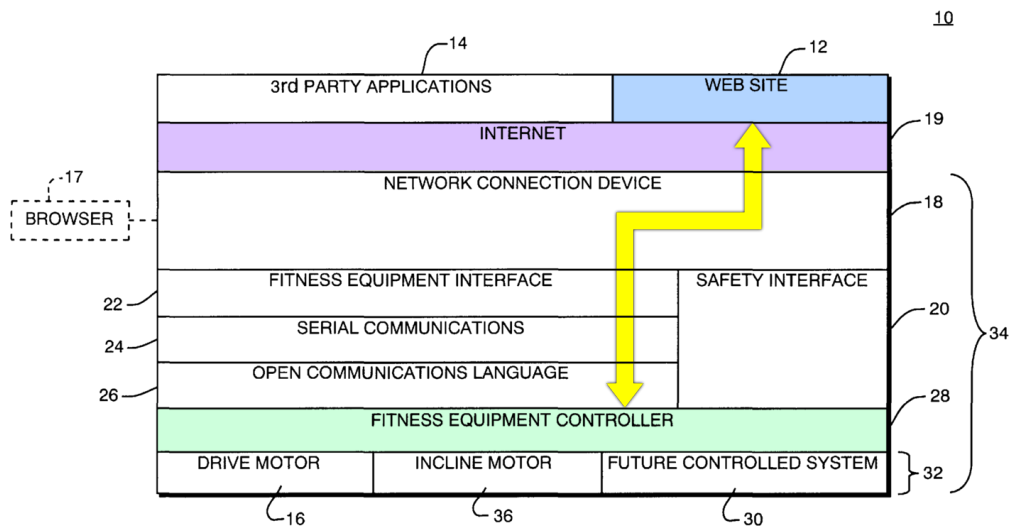


FIG. 1

Ex. 1012, Fig. 1 (annotated)

366. Clem also discloses a number of safety mechanisms: including (1) “[a] safety interface 20 is provided within user location 34 between controller 28 and network connection device 18 for detecting whether a user falls off or the user heart rate goes too high and shutting the treadmill off,” and (2) “a braking system”

which the controller can control using “control signals.” Ex. 1012, 3:27-31, 4:56-59.

B. Summary of Hickman

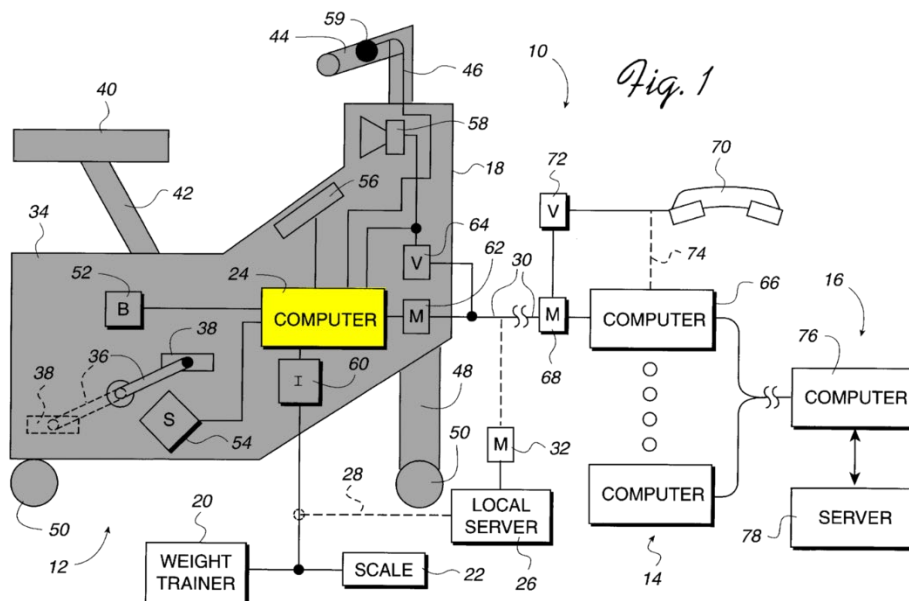
367. Hickman describes an exercise system with a “local system having an exercise apparatus and an associated local computer, where the local computer controls and monitors the operation and use, respectively of the exercise apparatus” and a “remote system” having a “remote computer.” The system includes coupling the “local system and the remote system for data communication.” The local computer controls the operation of the exercise apparatus based on a modifiable script, which can be updated by the remote system.

An exercise system includes a local system having an exercise apparatus and an associated local computer, where the local computer controls and monitors the operation and use, respectively, of the exercise apparatus. The system further includes a remote system having a remote computer, and a transmission medium including a telephone line that couples the local system to the remote system for data communication between the local system and the remote system. The remote system may receive local system data from the local system concerning the use of the exercise apparatus, and the local system may receive remote system data from the remote system concerning the operation of the exercise apparatus. The local computer preferably controls the operation of the exercise apparatus based upon a

modifiable script stored in a read/write memory of the local computer, which can be updated by the remote system. A method for controlling an exercise apparatus includes running a modifiable script on a local computer to control the use and to monitor the operation of an exercise apparatus, and communicating with a remote system to provide the remote system with data concerning the use of the exercise apparatus. The script is stored in read/write memory of the local computer and remote system data received from the remote system may include at least a portion of a new script to be stored in the read/write memory of the local computer.

Ex. 1013, Abstract.

368. As shown in Figure 1, the computer in Hickman is integrated into a stationary bicycle. This computer controls the “electrically actuated break,” thereby controlling the resistance of bicycle.



Ex. 1013, Fig. 1 (annotated)

This resistance device can be weights, or can be an active resistance device such as a motor, or a **passive resistance device such as an electrically actuated brake**. In any event, **the amount of resistance to movement of the bar is preferably under the control of the computer 24 and the script that it is running**.

Ex. 1013, 4:31-35.

More particularly, **computer 24 can, under software and hardware control, control the electrically actuated brake 52 which is coupled to the crank 36 of the stationary bicycle**. In this fashion, the pedaling force that must be exerted on pedals 38 to cause the crank 36 to rotate at a given speed **can be varied under computer control**. This electrically actuated brake can be electric/mechanical brake, electric/magnetic brake, etc. as it is well known to those skilled in the art.

Ex. 1013, 4:46-53.

369. The exercise program described in Hickman proceeds according scripts. The script can vary based on user input, human personal trainer input from the remote system, or based on user performance. For example, the script can scale a workout so that the user performs a workout that is proportional to what was originally planned. Likewise, if the heart rate is found to be too high, the resistance is reduced via a signal to the brake.

370. As noted above, the exercise program preferably proceeds according to “scripts.” A script is simply a sequence of exercise or other health-related events that are performed in fixed or variable sequences. The order and structuring of the script can be modified based upon monitoring the user’s performance or by other user feedback. For example, if it is detected that the user is getting tired due to a slowing of the exercise repetition rate, the steps or parameters of the exercise script can be modified accordingly. In other words, certain script steps can be skipped or the parameters concerning the steps can be modified. For example, if a user is determined to be tiring by the local system 12, and if the script says the next exercise event is to be ten repetitions on the weight trainer 20, that step could be skipped. Alternatively, the weight training step could still be done, but the resistance parameters could be modified. For example, instead of doing ten repetitions at a hundred pounds resistance on the weight trainer 20, eight repetitions at eighty pounds of resistance might be called for. The script therefore provides a general framework of a desired exercise session which can be varied based upon human personal trainer input from remote system 14, user input at local station 12, and detected user performance at local station 12.

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variable sequences. The order and structuring of the script can be modified based upon monitoring the user's performance or by other user feedback. For example, if it is detected that the user is getting tired due to a slowing of the exercise repetition rate, the steps or parameters of the exercise script can be modified accordingly. In other words, certain script steps can be skipped or the parameters concerning the steps can be modified. For example, if a user is determined to be tiring by the local system 12, and if the script says the next exercise event is to be ten repetitions on the weight trainer 20, that step could be skipped. Alternatively, the weight training step could still be done, but the resistance parameters could be modified. For example, instead of doing ten repetitions at a hundred pounds resistance on the weight trainer 20, eight repetitions at eighty pounds of resistance might be called for. The script therefore provides a general framework of a desired exercise session which can be varied based upon human personal trainer input from remote system 14, user input at local station 12, and detected user performance at local station 12.

Ex. 1013, 7:59-8:14.

Next, in a step 118, it is determined whether the session is a modifiable session. Most sessions are preferably be modifiable, unless the user selects, in a step 112, a non-modifiable session. If the session is modifiable, the session is modified in a step 120 based upon the selected script and upon user activity or other input. For example, if the heart rate monitor 59 detects that the pulse rate is

too high, the resistance on the crank 36 can be reduced via a signal to the brake 52. Next, in a step 122, it is determined whether the session is completed. This is usually based on the script, although the user can always terminate a session. If the session is not completed, process control is returned to step 116 to repeat the loop. If the session is completed, the session records are updated in the mass storage 88, as are the scripts, as indicated in step 124. The process 100 is then completed at step 126.

Ex. 1013, 8:32-47.

371. Hickman further includes a display and speaker to include instructions from the remote trainer. For example, an auditory signal can be provided to the user to inform them the resistance will increase (upon which time the resistance does increase). Such audio or visuals can provide encouragement or a preview as well as instructions.

Next, in a step 132, it is determined whether encouragement is needed. An example of encouragement being needed is when the person is slowing down below the suggested repetition rate or speed in the script or, for example, has stopped exercising entirely. In such circumstances, encouragement is given in a step 134. Again, **this encouragement can be auditory via speaker 58, or visual via display 56, a combination of the two, or in any other suitable fashion.** Next, in a step 136, it is determined whether a caution is needed. If so, the caution is given in a step 138 either through auditory, visual, or other ways. Caution might be needed if the user is

exercising faster than that suggested by the script or if a dangerous physical condition is detected, such as by the HRM 59. Next, in a step 140, it is determined if a script preview should be provided. If yes, **a step 142 provides an auditory, visual or other type of preview of upcoming script events**. For example, the system 12 could be taking a user on a imaginary bicycle ride through the country. The script preview would then, **in a step 142, indicate something like “We are now approaching a hill. You will note an increased resistance to pedaling in a few seconds which will steadily increase until we reach the crest of the hill in about one and a half minutes.”** These steps 134, 138, and 142 are further examples of the local system 12 serving as a “virtual personal trainer.” The process 116 is completed at step 144.

Ex. 1013, 8:57-9:15.

372. Hickman also includes diagnostic checks to ensure that the system works properly. It also includes a “batch system connection [that] can be used to update the software on a number of computers 24 of local system 12, or to upload exercise session data from a number of local systems 12 on a regular basis, *e.g.* daily, weekly, monthly, etc.” Such software upgrades are downloaded from the remote system computer.

A second type of local system activity would be housekeeping. For example, in a step 152, **diagnostics can be run to check the operability and calibration of the various components of local**

system 12. Also, in a step 154, data compression, hard disk compaction, and data preparation can be accomplished.

Ex. 1013, 9:30-35.

Information being uploaded can include parameters and data stored in the mass storage 88 concerning the exercise sessions by the user(s) of the local system 12. It can also include **other system information used for diagnosing or improving the operation of the local system 12**. In addition, **information can be downloaded to the local system 12 from the remote system computer 66 to, for example, change exercise scripts for a user, provide upgrades for the software running on the local system computer 24, etc.**

Ex. 1013, 10:37-45.

In FIG. 8, a process 166 running on a remote system computer 66 is illustrated. The process 166 begins at 168 and, in a step 170, an activity type is determined. A first type of activity is a **batch system connection whereby the remote system computer 66 sequentially connects with a series of local systems for the uploading or downloading of information**. This process is accomplished in step 172. **A batch system connection can be used to update the software on a number of computers 24 of local system 12**, or to upload exercise session data from a number of local systems 12 on a regular basis, *e.g.* daily, weekly, monthly, etc.

Ex. 1013, 10:46-56.

C. Reasons to Combine Clem and Hickman

373. A POSITA would be motivated to combine Clem with Hickman with a reasonable expectation of success because they share a common field of endeavor and solve similar problems known in the art. As I discussed previously, both Clem and Hickman are exercise systems with both local and remote computer systems. Both the remote and local computer systems in both Clem and Hickman can control the operating parameters of the exercise apparatus.

374. Both Hickman and Clem also solved similar known problems. As Clem notes, there was a need for exercise devices that “provide the ability to conveniently alter the control programs within the exercise equipment or to communicate with others regarding control of the exercise equipment during a work out.” Ex. 1012, 1:59-62. Both Clem and Hickman solved these problems, as both allowed for a personal trainer remote from the local system to control the exercise equipment during a work out.

375. Likewise, both Hickman and Clem allow for a personal trainer to instruct a user’s home workout, thus providing, as Hickman itself recognized, a “convenient, affordable, and effective” exercise and health system that, as Hickman notes, was missing in the prior art. Ex. 1013, 1:20-2:21 (describing problems with gyms and home exercise equipment and how Hickman’s feature for remote communication with a trainer is beneficial).

376. Given the similar field of endeavor and the fact that both Clem and Hickman solve similar problems known in the art in a similar way, a POSITA would have been motivated to combine them. Given these similarities, a POSITA would have looked to the teachings of the other that would have been a complement or obvious extension of their shared goal to provide a convenient and effective exercise system, particularly given that many of these features were known Internet-related communication features. To the extent there are specific features that are needed to be combined, I discuss those below.

D. Independent Claims 1 and 29

[1.0]/[29.0] An exercise device configured to enable interaction of a user, the exercise device comprising:

377. Clem teaches a “fitness system 10” (“*exercise device*”) that includes a “programmable fitness device 32” that interacts with the user to, among other things: (1) allow the user at user location 34 to engage in “a real time two way communication regarding matters related to fitness,” and (2) allow the user to communicate “commands” related to the selection of a control program (“*enable interaction of a user*”).

378. Clem teaches a fitness system 10 with programmable fitness device 32 being a treadmill as shown in Fig. 2A. It is further described below.

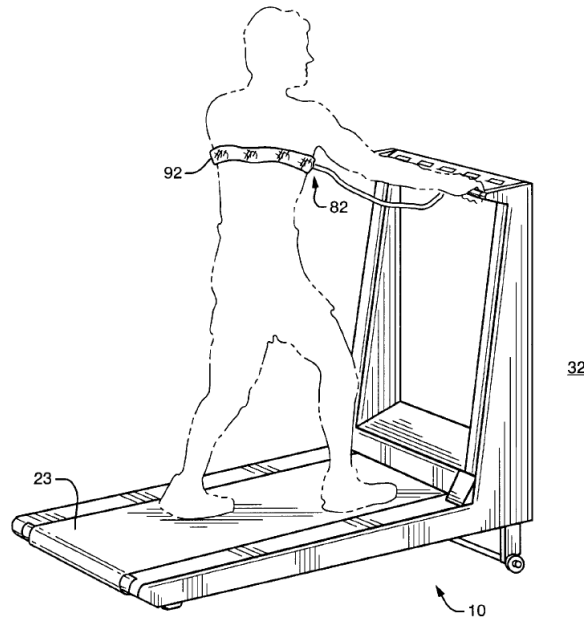


FIG. 2A

Ex. 1012, Fig. 2A

Referring now to FIGS. 2A-C, **there is shown an exercise apparatus 32** having a plurality of resistance mechanisms, wherein the **exercise equipment 32 is shown as a treadmill.**

Ex. 1012, 3:64-66.

379. The fitness system 10 is “*configured to enable interaction of a user*” in a number of ways.

Thus, the present invention is **an interactive fitness system** for **permitting a user of a programmable exercise device to interact with a fitness server device** while the user is in a location remote from the fitness server device. For example, **the user can interact with the fitness server device** from the home of the user. Using the system of the present invention the user can download new fitness

equipment programs for controlling the exercise equipment. **The user can also interact with fitness experts on-line and provide exercise information and receive control information wherein the received control information can permit interaction between the fitness server device and the user.**

Ex. 1012, Abstract.

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 **to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment.** For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12. **The communication can include the uploading and downloading of video and audio information.**

Ex. 1012, 2:53-65.

Device information such as speed, incline and suspension can also be communicated by the user or automatically by way of the internet system 19. Any other information useful for interaction between the user location 34 and the web site 12 can also be applied to the internet system 19. **The user information and the device information can**

be used by the web site 12, as well as **by the controller 28**, to calculate, for example, calorie information.

Ex. 1012, 3:46-49.

380. A POSITA would know these interactions can occur through “user input 96” and “display 98” on “console 94” as shown in Fig. 3 and described below and in the previous paragraph.

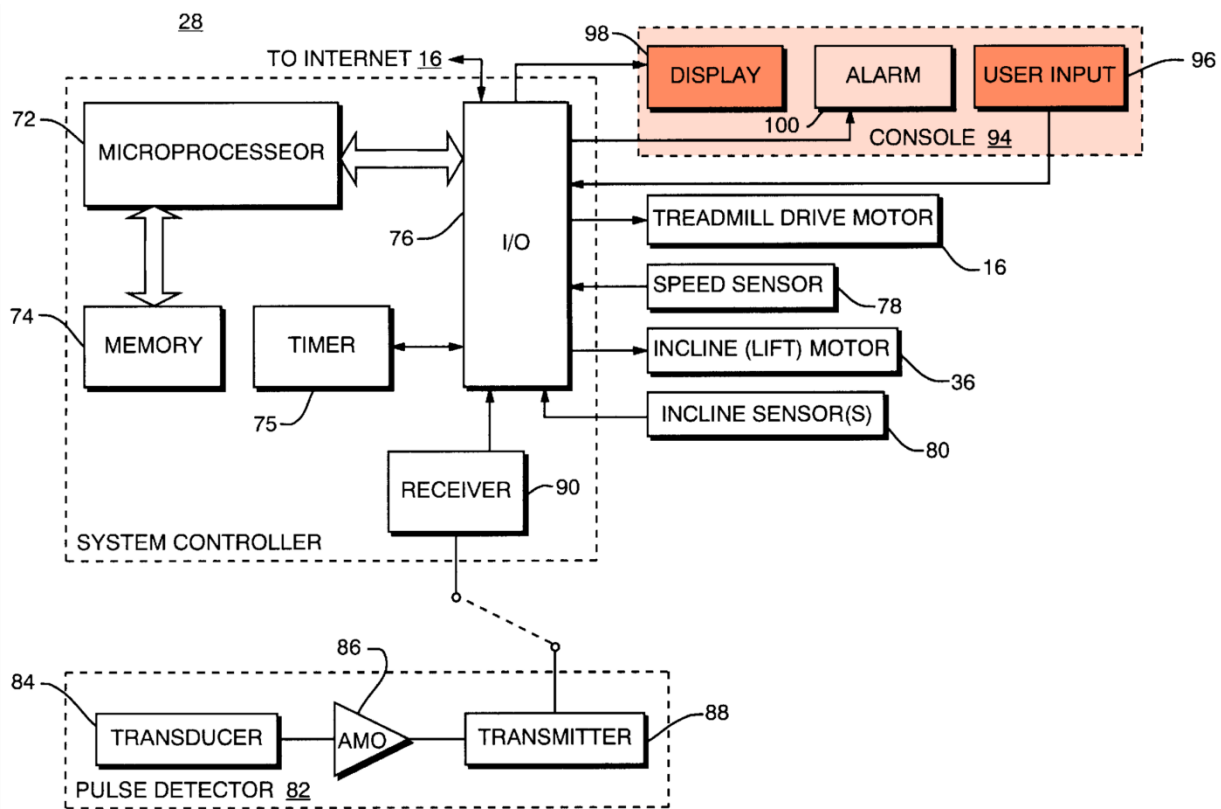


FIG. 3

Ex. 1012, Fig. 3 (annotated)

The output signals of the microprocessor 72 also control the display 98 which can be located on a console 94 of the exercise equipment 32. It will be understood that information representative of the operation of any of the devices included in the controller 28 can be interactively transmitted 20 between the user location 34 and the web site 12 by way of I/O circuitry 76 which is coupled to the internet system 19 by way of interface 22.

Ex. 1012, 5:16-23.

381. Thus, because Clem teaches a fitness system 10 that includes a programmable fitness device 32 configured to interact with a user through a console, including but not limited to allowing the user to: (1) to engage in “a real time two way communication regarding matter related to fitness,” or (2) allow the user to communicate “commands” related to the selection of a control program, Clem discloses “[a]n exercise device configured to enable interaction of a user” as recited in the claims.

[1.1]/[29.1] (a) an exercise mechanism comprising a movable element for movement in performance of exercise by a user, the exercise mechanism having one or more operating parameters;

382. **First**, Clem teaches “*an exercise mechanism comprising a movable element for movement in performance of exercise by a user.*” Clem teaches that its fitness system 10 includes fitness device 32 (“*exercise mechanism*”) in the form of a treadmill with a continuous tread belt 23 (highlighted below) (“*movable*

element”) for the user to move in performance of an exercise routine, as shown in

Fig. 2:

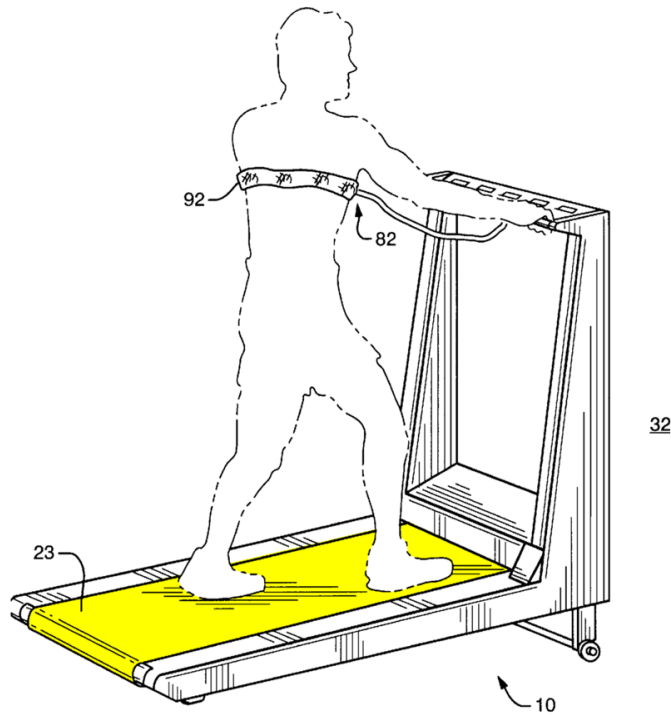


FIG. 2A

Ex. 1012, Fig. 2A (annotated)

Referring now to FIGS. 2A-C, there is shown an exercise apparatus 32 having a plurality of resistance mechanisms, wherein the exercise equipment 32 is shown as a treadmill.

Ex. 1012, 3:64-66.

In the fitness device 32 the first resistance mechanism 13 is a speed-varying mechanism and the second resistance mechanism is a grade-adjustment mechanism 15. In order to vary the speed of the fitness device 32, and thus increase the resistance of the first resistance

mechanism 13, **a variable speed drive motor 16 is mechanically coupled in a conventional manner by a drive belt 19 to a drive roller 21 to rearwardly move a continuous belt 23.** The **continuous belt 23 is a rotating surface** that rides upon a low-friction support surface 25. Although a drive belt 19 is shown for coupling the drive roller 21 to the drive motor 16, gears or the like can also be used. A freely-rotating rear roller 27 is provided to redirect the continuous belt 23 forwardly beneath the support surface 25 in a conventional manner.

Ex. 1012, 4:8-21.

383. **Second**, Clem teaches “*the exercise mechanism having one or more operating parameters.*” The treadmill in Clem has operating parameters that include “speed, incline and suspension”:

Device information such as speed, incline and suspension can also be communicated by the user or automatically by way of the internet system 19.

Ex. 1012, 3:47-49.

384. These parameters are controlled by “resistance mechanisms.” The mechanisms listed in Clem for the treadmill 32 include “a speed-varying mechanism” and “a grade-adjustment mechanism.” Clem describes how the device uses motors to adjust the speed and grade (incline).

In the fitness device 32 the first resistance mechanism 13 is a speed-varying mechanism and the second resistance mechanism is a grade-adjustment mechanism 15. In order to vary the speed of the fitness device 32, and thus increase the resistance of the first resistance mechanism 13, **a variable speed drive motor 16 is mechanically coupled in a conventional manner by a drive belt 19 to a drive roller 21 to rearwardly move a continuous belt 23.** The **continuous belt 23 is a rotating surface** that rides upon a low-friction support surface 25. Although a drive belt 19 is shown for coupling the drive roller 21 to the drive motor 16, gears or the like can also be used. A freely-rotating rear roller 27 is provided to redirect the continuous belt 23 forwardly beneath the support surface 25 in a conventional manner.

The continuous belt 23 is adapted to prevent slippage on the drive roller 21 under ordinary loads. This can be accomplished by providing proper tensioning, coefficients of friction or by having treads in the underside of the belt 23 to mate with the drive roller 21. Thus, **as the drive motor 16 rotates, the belt 23 rotates at a corresponding speed.** Preferably, the drive motor 16 is a DC motor, for which the drive signals are voltages of appropriate levels applied to the motor 16 for specified periods of time. **The fitness equipment controller 28 can provide one or more signals that determine the resistance level of the first resistance mechanism 13 for controlling the speed of the fitness device 32.**

Ex. 1012, 4:8-43.

The incline motor 36 is also controlled by signals from the controller 28. The incline motor 36 can be a stepping motor controlled by controller signals that are pulses. It can also be an AC or DC motor 36 wherein the control signals from the controller 28 cause voltages of appropriate levels to be applied to the incline motor 36 for specified periods of time. For example, a conventional treadmill incline mechanism can be used wherein a control signal activates a relay to apply power to a fractional AC motor until the grade is incremented by the desired amount. **In this manner, the controller 28 provides one or more signals that determine the grade of the drive roller 21 and thereby the resistance level of the second resistance mechanism 15.** Additionally, a braking system can be provided in the fitness device 32 and the controller 28 can control the braking system using control signals.

Ex. 1012, 4:44-59.

385. Accordingly, Clem's treadmill has multiple operating parameters that can be adjusted, including the speed of the belt and the incline of the ramp.

386. Thus, Clem discloses these limitations.

[1.2] (b) interface means, communicating with the exercise mechanism, for gathering a first signal from the user;

[29.2] (b) at least one user interface device, communicating with the exercise mechanism, the at least one interface device gathering a first signal from the user;

387. Clem renders obvious an interactive interface found on the console (“*user interface device*”/“*interface means*”) of the fitness device that communicates with the exercise mechanism to gather a signal from the user.

388. Clem teaches an exercise system which comprises “**an interactive interface connected to the user’s location, wherein commands related to the database can be entered** at the user location.” Ex. 1012, cl. 23. A POSITA would recognize that this interactive interface, as discussed in Claim 23 of Clem, is found and described in console 94 of the programmable exercise device. This console allows for “user input 96,” which communicates with the controller in the exercise mechanism via I/O (Input/Output) circuitry 76” (“*communicating with the exercise mechanism*”).

389. A POSITA would have understood that input of “commands related to the database” that occurs at the *user interface device/interface means* includes the selection of a program from the web site by the user, given that the database (as described in Clem, cls. 1, 23) is described to be “remote from the user’s location” (a web site) and Clem describes that the web site “can store a plurality of control programs and select a control program from the plurality according to ... current user location information.”

An exercise system including an exercise device at a user location,
comprising: [...]

an automated control location **remote from the user location**; [...]

control information applied to the communication system by the automated control location in response to the user identifying information for transmission to the controller to control the exercise device according to the control information, **wherein the control information is automatically derived by the automated control location from a database derived at the automated control location based on the user identifying information.**

Ex. 1012, cl. 1.

The exercise system of claim 1, wherein one of a plurality of control programs **is selected** according to the user location information.

Ex. 1012, cl. 17.

The exercise system of claim 1, further comprising **an interactive interface connected to the user location, wherein commands related to the database can be entered at the user location.**

Ex. 1012, cl. 23.

For example, the user can interact with the fitness server device from the home of the user. **Using the system of the present invention the user can download new fitness equipment programs for controlling the exercise equipment.** The user can also interact with fitness experts on-line and provide exercise information and receive control information wherein the received control information can permit interaction between the fitness server device and the user.

Ex. 1012, Abstract.

For example, the user can interact with the fitness server device from the home of the user. Using the system of the present invention the user can download new fitness equipment programs for controlling the exercise equipment. The user can also interact with fitness experts on-line and provide exercise information and receive control information wherein the received control information can permit interaction between the fitness server device and the user.

Ex. 1012, 2:14-21

However, in a preferred embodiment of the fitness system 10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28. In this preferred embodiment the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12. Additionally, a digest of information for each user of fitness system 10 can be accumulated by the web site 12 and the control information can be determined according to the digest as well as the current user location information. For example, the web site can store a plurality of control programs and select a control program from the plurality according to the digest and the current user location information.

Ex. 1012, 3:1-15.

390. As shown in the highlighted Fig. 3 below, the console at the user input (in orange) gathers signals from the user (signal pathway highlighted in yellow) and communicates them to the treadmill's controller (highlighted in green) through input/output circuitry ("*communicating with the exercise mechanism*") which then communicates through the internet (highlighted in purple) to a remote web site (for real-time communication) of the exercise device. The web site then sends a control signal back to the controller, which in turn provides "control signals required for controlling motors" that control the incline and speed of the treadmill (highlighted in pink).

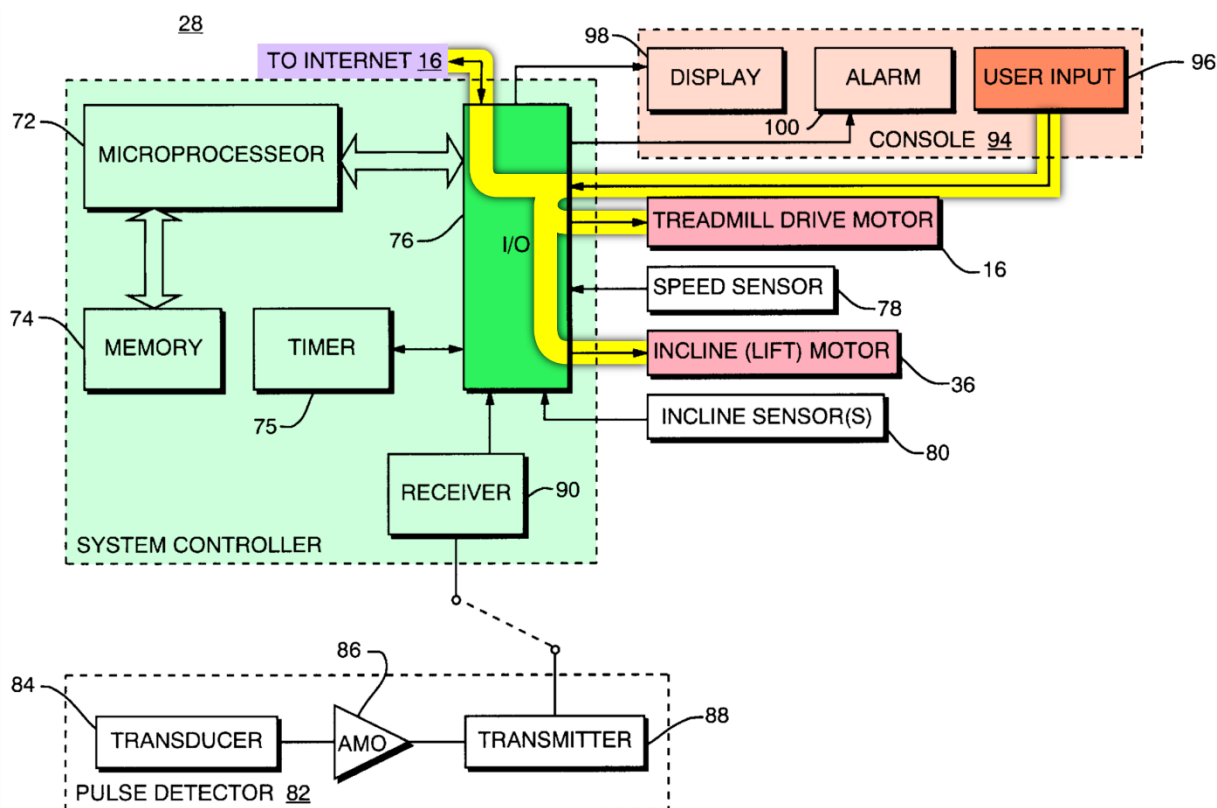


FIG. 3

Ex. 1012, Fig. 3 (annotated)

The control information transmitted from the web site 12 can include control signals for directly controlling the fitness device 32. However, in a preferred embodiment of the fitness system 10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28. In this preferred embodiment the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12.

Ex. 1012, 2:66-3:7.

Referring now to FIG. 3, there is shown a **block diagram representation of the controller 28 of the programmable fitness device 32. The controller 28 can include a microprocessor 72, a memory 74, a timer 75 and input/output (I/O) circuitry 76 connected in a conventional manner.** The memory 74 can include random access memory (RAM), read-only memory (ROM), or any other type of storage means. **The I/O circuitry 76 can include conventional buffers, drivers, relays and the like, such as for driving the motors 16, 36 with sufficient power.** Conventional circuitry for latching output signals from the microprocessor 72 is also ordinarily included in the output circuitry 76. Thus, **output signals from the microprocessor 72, interfaced through the output circuitry 76, control the drive motor 16 and incline motor 36.**

Ex. 1012, 5:1-14

The output signals of the microprocessor 72 also control the display 98 which can be located on a console 94 of the exercise equipment 32. It will be understood that **information representative of the operation of any of the devices included in the controller 28 can be interactively transmitted between the user location 34** and the web site 12 by way of I/O circuitry 76 which is coupled to the internet system 19 by way of interface 22.

Ex. 1012, 5:16-24.

391. Clem also teaches that a user can interact on-line with a live fitness expert located at the web site to engage in a real two way communication. This

communication can include the uploading and downloading of video and audio information and is “a real time two way communication.” The only location shown in Figure 3 and most likely location described by Clem for user input (required for two way communication) is found on the console. Thus, a POSITA would understand that the display of the console is where such information would be viewable and the console would be where user input (such as video or audio) would be inputted and then signals corresponding to the video or audio inputted sent to the web site.

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment. For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12.

The communication can include the uploading and downloading of video and audio information.

Ex. 1012, 2:53-65.

392. The specification of the '062 Patent provides an explicit definition for the term *communicating with*: “any type of applicable communication known to one skilled in the art in light of the disclosure herein, such as electrical communication, optical communication, physical communication, magnetic communication, software communication, hardware communication, data communication, and the like.” Even if this definition is read into the claims, Clem teaches it because the console communicates with the treadmill (“*exercise mechanism*”) through at least electrical and data communication by sending adjustment signals to control the treadmill or selecting a program as well as through audio and video information as part of the real time two-way communications between the user and the live fitness expert. *See* Ex. 1001, 8:36-58; Ex. 1012, Fig. 3, 2:53-65. Clem further recognizes that “[a]ny suitable open communication language 26 can be used for communicating [] information from the controller 28,” indicating that information to and from the controller is communicated through any open communication language. Ex. 1012, 3:26-27.

393. To the extent Clem does not explicitly teach it, a POSITA would have been motivated to include an interface for gathering signals from a user into the treadmill in Clem. As Clem discusses, users of exercise equipment could manually input information to adjust resistance levels, which a POSITA would know would be done on an interface. Ex. 1012, 1:26-28. Indeed, such user interfaces were

common. For example, Studor and Brewer both discuss a user interface which collected signals from the user. Ex. 1006, Fig. 1 (showing console with user interface); Ex. 1005, 6:3-11 (describing “user interface” which “enables interactivity to control audio-video environments”). Brewer recognized that “motorized treadmills typically have a speed control by which the user may vary the speed of the belt of the treadmill between stop and a maximum speed.” Ex. 1006, 1:29-33. As such, a POSITA have been motivated and able to include such a user interface to accept the selection of a program to control the speed and/or incline of the treadmill into the treadmill discussed in Clem.

394. Thus, Clem renders obvious “*interfacing means, communicating with the exercise mechanism, for gathering a first signal from the user*” and “*at least one user interface device, communicating with the exercise mechanism, the at least one interface device gathering a first signal from the user*” as recited in the claims.

[1.3] (c) communicating means, communicating with the interface means, for receiving a packetized second signal from a remote source over a network, the packetized second signal including one or more packetized control signals; and

[29.3] (c) a communicating mechanism, communicating with the user interface device, the communicating mechanism receiving a packetized second signal from a remote source over a network, the packetized second signal including one or more packetized control signals; and

395. First, Clem teaches a “network connection device 18,” “fitness equipment interface 22,” and “controller 28” (together the “*communicating*

means”/“*communicating mechanism*”) that communicates with Clem’s console (“*interface means*”/“*user interface device*”) in fitness device 32.

396. As example, the signals of microprocessor 72 in the controller 28 controls the display on the console. These signals are “interactively transmitted” to or from “web site 12 by way of I/O circuitry (part of controller 28) which is coupled to the internet system 19 by way of interface 22.” As such, the communicating mechanism communicates with the console (“interface means”/“user interface device”).

The output signals of the microprocessor 72 also control the display 98 which can be located on a console 94 of the exercise equipment 32. It will be understood that *information representative of the operation of any of the devices included in the controller 28 can be interactively transmitted between the user location 34 and the web site 12 by way of I/O circuitry 76 which is coupled to the internet system 19 by way of interface 22.*

Ex. 1012, 5:15-22.

397. Likewise, the console includes a “user input” which could be used for the uploading and streaming of video and audio information to be conveyed with a “live fitness expert located at the web site 12.” Such communication occurs via the network connection device, fitness equipment interface, and the controller.

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment. For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12. The communication can include the uploading and downloading of video and audio information.

Ex. 1012, 2:53-65.

A fitness equipment interface 22 is provided for coupling the fitness device 32 to the network connection device 18. A communication channel 24 is provided between the fitness device 32 and the fitness equipment interface 22 for transmitting information therebetween. Any suitable open communication language 26 can be used for communicating this information from the controller 28. A safety interface 20 is provided within user location 34 between controller 28 and network connection device 18 for detecting whether a user falls off or the user heart rate goes too high and shutting the treadmill off.

Ex. 1012, 3:21-33.

The user location 34 interactively applies and receives the interactive information to the internet system 19 by way of network connection device 18. The network connection device 18 can be a network computer, a personal computer, a cable television box, or any other suitable connection device. The user location information transmitted by way of the network connection device 18 can include personal information identifying or describing the user to the web site 12. For example, in addition to a user password if desired, the user location 34 can provide user information such as user heart rate, weight, age and gender.

Ex. 1012, 3:34-47.

398. Fig. 1 of Clem shows “a schematic representation of the interactive programmable fitness system of the present invention.” Ex. 1012, 2:24-25. As I have highlighted and annotated below, Clem includes a remote source (in blue) that sends and receives signals (signals shown with yellow arrows) over the internet (a “*network*,” in purple) to the network connection device, fitness equipment interface, and controller (“*communicating mechanism*”).

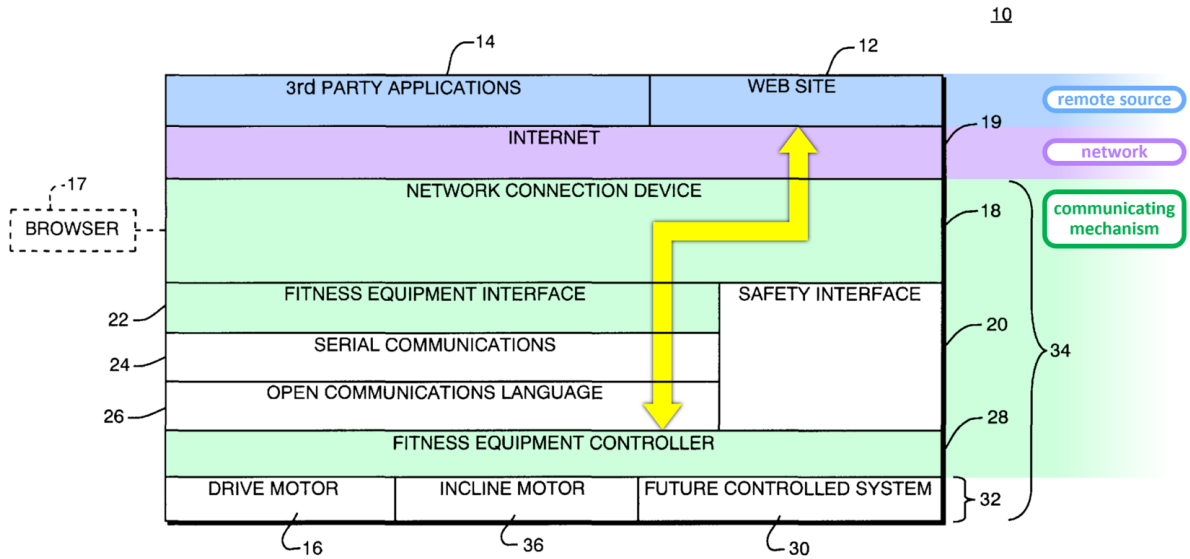


FIG. 1

Ex. 1012, Fig 1

399. Fig. 3 of Clem shows “a block diagram representation of a controller suitable for use in the exercise device of Figs. 2A-C.” Ex. 1012, 2:29-30. As shown, the signal (in yellow) can travel from a remote device (as shown in Fig. 1) over the internet (in purple), through the communicating mechanism (in green) to the user interface device (in orange).

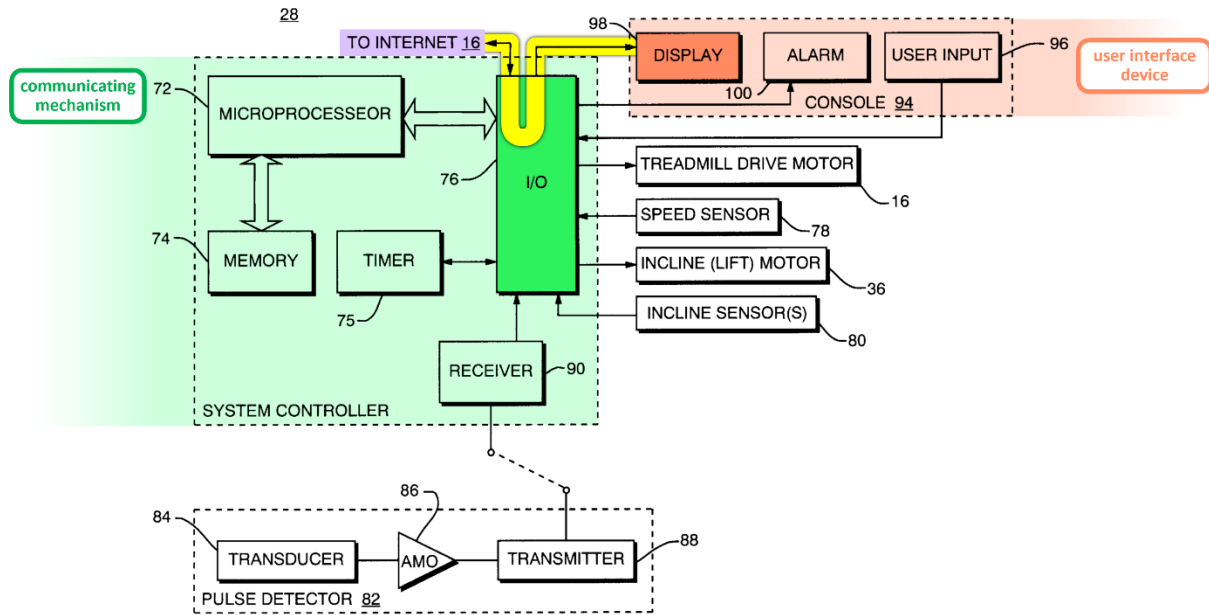


FIG. 3

Ex. 1012, Fig. 3 (annotated)

400. The specification of the '062 Patent provides a definition of *communicating with*: “any type of applicable communication known to one skilled in the art in light of the disclosure herein, such as electrical communication, optical communication, physical communication, magnetic communication, software communication, hardware communication, data communication, and the like.” Ex. 1001, 49:32-39. Even if this definition is read into the claims, Clem teaches it because the console communicates with the controller (part of the “*communicating mechanism*”) through at least electrical and data communication by sending adjustment signals to control the treadmill as well as audio and video information as part of the real time two-way communications between the user and the live fitness expert. *See* Ex. 1001, 8:36-58; Ex. 1012, Fig. 3, 2:53-65. Clem further

recognizes that “[a]ny suitable open communication language 26 can be used for communicating [] information from the controller 28,” indicating that information to and from the controller is communicated through any open communication language. Ex. 1012, 3:26-27.

401. Thus the console communicates with the network communication device, fitness equipment interface and controller (“*communicating mechanism*”).

402. Thus Clem teaches “*a communicating mechanism, communicating with the user interface device*” and “*communicating means, communicating with the exercise mechanism.*”

403. **Second**, the network connection device, fitness equipment interface and controller (“*communicating mechanism*”/“*communicating means*”) receives packetized signals from web site 12 or third party applications 14 (“*remote source*”) over internet system 19 (“*a network*”). This “*communicating mechanism*”/“*communicating means*” sends and receives interactive information over the internet system 19 between the exercise device at user location 34 and web site 12 or third party applications 14. Such interactive information includes uploading and downloading of video and audio information, such as two way communication regarding exercise routines and exercise equipment, as well as signals to control the motors in the exercise device (“*packetized second signal*”).

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment. For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12. **The communication can include the uploading and downloading of video and audio information.**

Ex. 1012, 2:53-65.

The user location 34 interactively applies and receives the interactive information to the internet system 19 by way of network connection device 18. The network connection device 18 can be a network computer, a personal computer, a cable television box, or any other suitable connection device. The user location information **transmitted by way of the network connection device 18 can include personal information identifying or describing the user to the web site 12.** For example, in addition to a user password if desired, **the user location 34 can provide user information such as user heart rate,** weight, age and gender.

Ex. 1012, 3:34-47.

The fitness system 10 includes a programmable fitness device 32 interactively coupled with a web site 12. The fitness device 32 is disposed at a user location 34 at a location that is geographically remote from the web site 12. The interactive coupling between the fitness device 32 and the web site 12 can be by way of an internet system 19. **The interactive coupling permits the fitness device 32 to transmit various kinds of user location information to the web site 12. It also permits the web site 12 to transmit control information to the user location 34 to control, for example, drive motor 16 and incline motor 36 of exercise device 32. Thus the web site 12 can operate as a server device for the user.** Information can be transmitted between the fitness device 32 and the web site 12 at any time, including immediately prior to an exercise session using fitness device 32 and during such an exercise.

Ex. 1012, 2:52-65.

Device information such as speed, incline and suspension can also be communicated by the user or **automatically by way of the internet system 19.** **Any other information useful for interaction between the user location 34 and the web site 12 can also be applied to the internet system 19.** The user information and the device information can be used by the web site 12, as well as by the controller 28, to calculate, for example, calorie information. **Calorie information calculated in this manner can be used to provide control signals for controlling the fitness device 32 according to the calorie information,** both in a current exercise

session and in a future one. **Information within the fitness system 10 can also be interactively communicated to and from third party applications 14.** An internet browser 17 can be coupled to the network connection device 18. The internet browser 17 permits the user of fitness system 10 to browse the internet system 19 both during and between exercise sessions.

Ex. 1012, 3:47-63.

It will be understood that **information representative of the operation of any of the devices included in the controller 28 can be interactively transmitted between the user location 34 and the web site 12 by way of I/O circuitry 76 which is coupled to the internet system 19 by way of interface 22.**

Ex. 1012, 5:17-22.

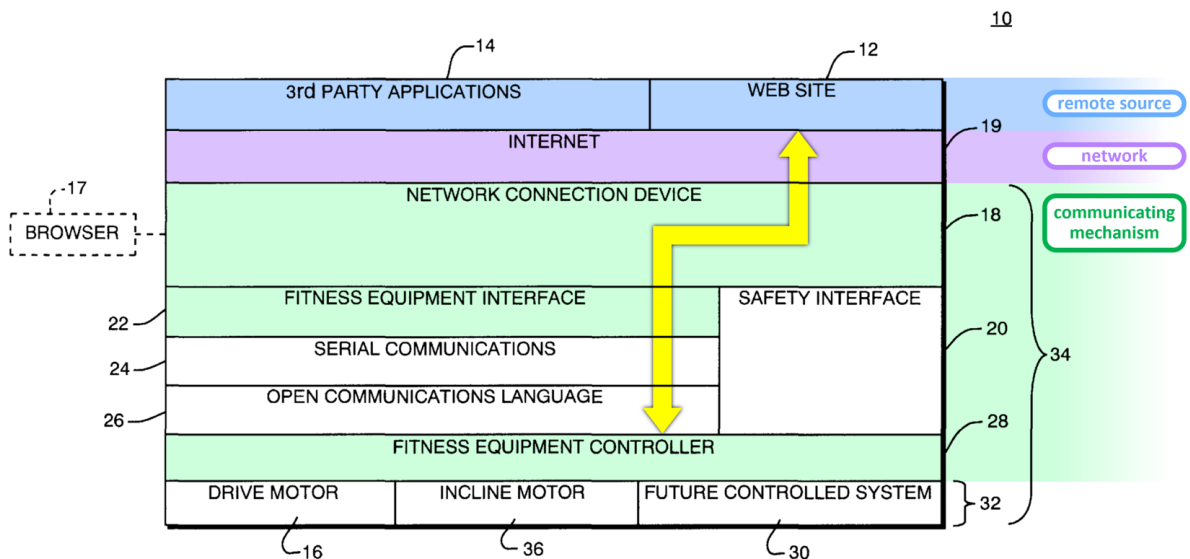


FIG. 1

Ex. 1012, Fig. 1 (annotated)

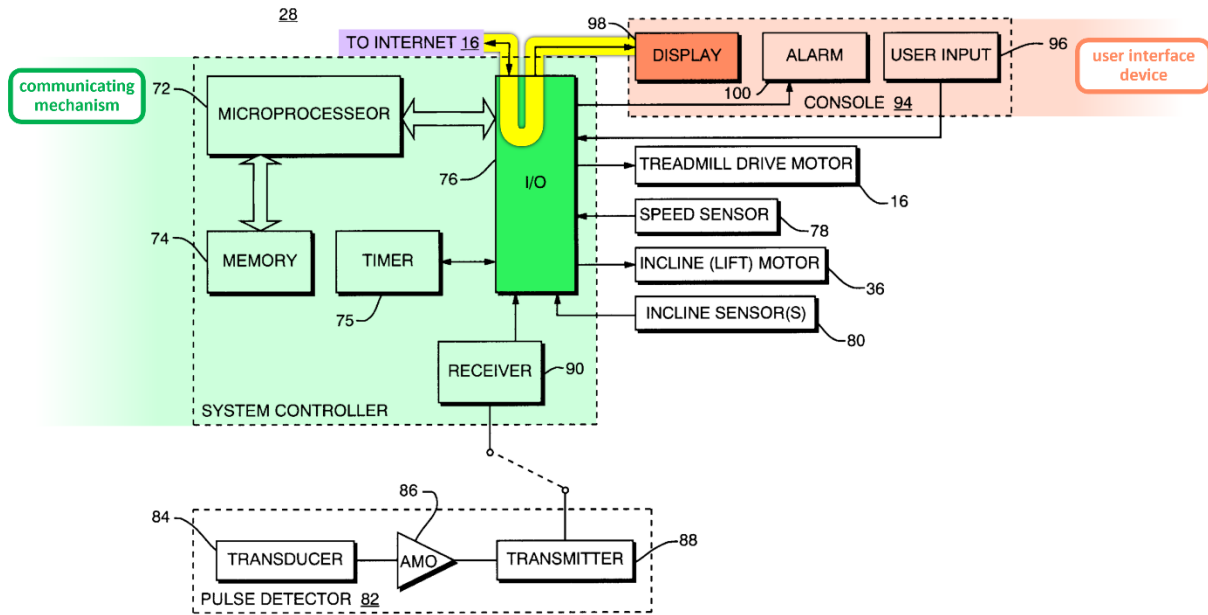


FIG. 3

Ex. 1012, Fig. 3 (annotated)

404. This information is conveyed through sending signals over the Internet system from the web site or third party application to the network connection device. Signals sent over the internet are packetized. Ex. 1024, 1 (“The Internet Protocol is designed for use in interconnected systems of packet-switched computer communication networks.... The internet protocol provides for transmitting blocks of data called datagrams from sources to destinations, where sources and destinations are hosts identified by fixed length addresses.”); *see also* Section V (state of the art). iFIT should agree, as in its own infringement contentions have stated as such.

This second signal is packetized because it is sent over the internet. More specifically, the second packetized signal is being sent using a TCP/IP protocol, which by definition, is a packetized protocol. An example of these is set forth below.

Ex. 1014, 24.

405. Thus Clem renders obvious “*the communicating mechanism receiving a packetized second signal from a remote source over a network*” and “*communicating means... for receiving a packetized second signal from a remote source over a network.*”

406. **Third**, of the packetized signals that make up the “second signal” sent by the web site or third party application (“*remote device*”) to the network communication device, fitness equipment interface and controller (“*communicating mechanism*”), at least one of them is a packetized control signal. In particular, Clem teaches that the exercise device may be controlled by “control signals” directly from the web site or control signals from the controller according to a control program received from the web site. As shown in Figure 3 (and described by Clem in 2:66-3:15), the controller controls the motors through signals it receives either from the web site or third party application (part of “*packetized second signal*”).

An exercise system including an exercise device at a user location includes a controller at the user location for controlling the exercise device. **A control location remote from the user location and a communication system for transmitting information between the exercise device and the control location are provided.** A sensor at the user location determines user location information and applies the

user location information to the communication system for transmission to the control location. **Control information is applied to the communication system by the control location in response to the user location information for transmission to the controller to control the exercise device according to the control information.** Thus, the present invention is an interactive fitness system for permitting a user of a programmable exercise device to interact with a fitness server device while the user is in a location remote from the fitness server device. For example, the user can interact with the fitness server device from the home of the user. Using the system of the present invention the user can download new fitness equipment programs for controlling the exercise equipment. The user **can also interact with fitness experts on-line and provide exercise information and receive control information wherein the received control information can permit interaction between the fitness server device and the user.**

Ex. 1012, Abstract.

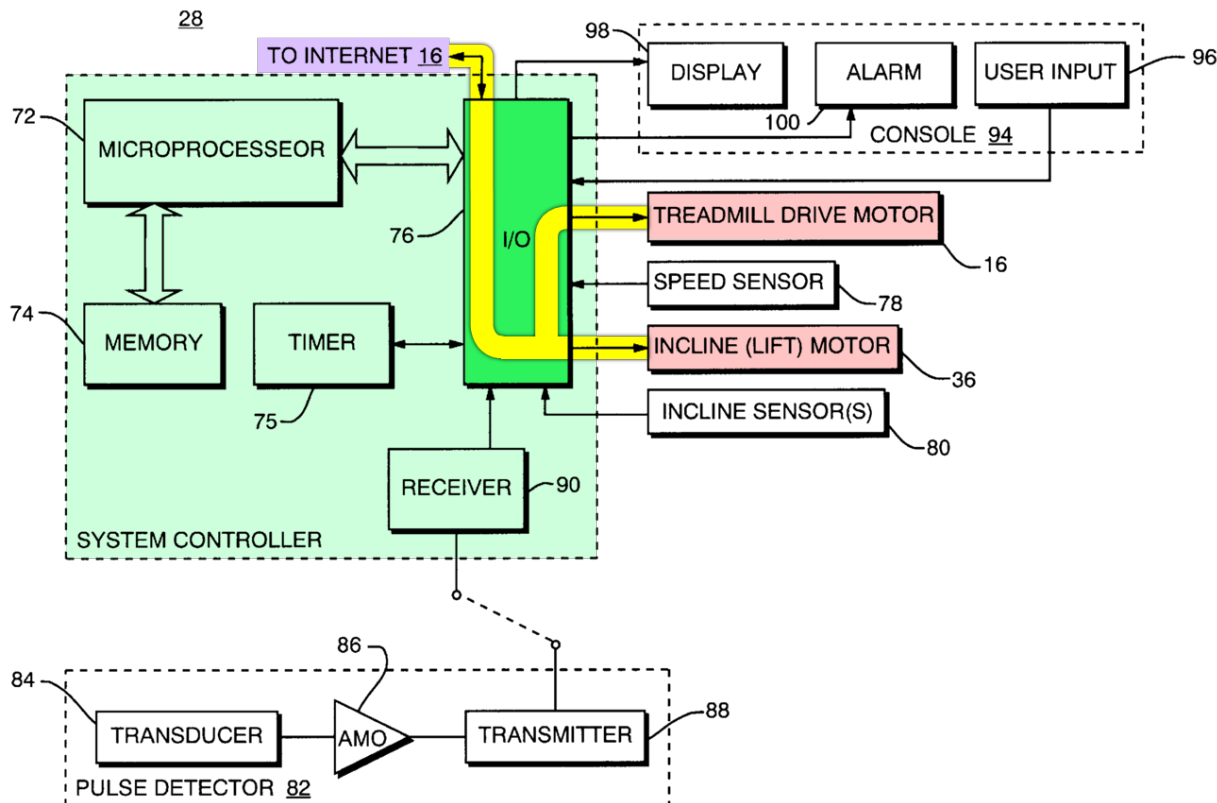
Referring now to FIG. 1, there is shown a schematic representation of the interactive programmable fitness system 10 of the present invention. The fitness system **10 includes a programmable fitness device 32 interactively coupled with a web site 12.** The fitness device 32 is disposed at a user location 34 at a location that is geographically remote from the web site 12. The interactive coupling between the fitness device 32 and the web site 12 can be by way of an internet system 19. **The interactive coupling permits the fitness**

device 32 to transmit various kinds of user location information to the web site 12. It also permits the web site 12 to transmit control information to the user location 34 to control, for example, drive motor 16 and incline motor 36 of exercise device 32. Thus the web site 12 can operate as a server device for the user. Information can be transmitted between the fitness device 32 and the web site 12 at any time, including immediately prior to an exercise session using fitness device 32 and during such an exercise session.

Ex. 1012, at 2:34-52.

The control information transmitted from the web site 12 can include control signals for directly controlling the fitness device 32. However, in a preferred embodiment of the fitness system 10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28. In this preferred embodiment the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12. Additionally, a digest of information for each user of fitness system 10 can be accumulated by the web site 12 and the control information can be determined according to the digest as well as the current user location information. For example, the web site can store a plurality of control programs and select a control program from the plurality according to the digest and the current user location information.

Ex. 1012, 2:66-3:14.



Ex. 1012, Fig. 3 (annotated)

However, in a preferred embodiment of the fitness system 10 **the control information from the web site 12** can be a fitness equipment control program **for execution by the controller 28**. In this preferred embodiment the **controller 28 provides the control**

signals required for controlling motors 16, 36 according to the control program received from the web site 12.

Ex. 1012, 3:1-7.

408. Thus, Clem renders obvious these limitations.

[1.4] (d) means, responsive to the packetized second signal, for controlling the operating parameters of the exercise mechanism.

[29.4] (d) a controller, responsive to the packetized second signal, configured to control the operating parameters of the exercise mechanism.

409. Clem renders obvious these limitations because Clem discloses a controller that responds to signals sent over the internet from a web site or third party application by controlling the speed or incline of the treadmill. I also refer to the highlighted Figure 3 above for the previous limitation.

Referring now to FIG. 1, there is shown a schematic representation of the interactive programmable fitness system 10 of the present invention. The fitness system **10 includes a programmable fitness device 32 interactively coupled with a web site 12.** The fitness device 32 is disposed at a user location 34 at a location that is geographically remote from the web site 12. The interactive coupling between the fitness device 32 and the web site 12 can be by way of an internet system 19. **The interactive coupling permits the fitness device 32 to transmit various kinds of user location information to the web site 12. It also permits the web site 12 to transmit control information to the user location 34 to control, for example, drive motor 16 and incline motor 36 of exercise device**

32. Thus the web site 12 can operate as a server device for the user. Information can be transmitted between the fitness device 32 and the web site 12 at any time, including immediately prior to an exercise session using fitness device 32 and during such an exercise session.

Ex. 1012, at 2:34-52.

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment. For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12. The communication can include the uploading and downloading of video and audio information.

Ex. 1012, 2:53-65.

The control information transmitted from the web site 12 can include control signals for directly controlling the fitness device 32. However, in a preferred embodiment of the fitness system 10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28. In this preferred embodiment the controller 28 provides the control

signals required for controlling motors 16, 36 according to the control program received from the web site 12.

Ex. 1012, 2:66-3:7.

The fitness equipment controller 28 can provide one or more signals that determine the resistance level of the first resistance mechanism 13 for controlling the speed of the fitness device 32.

Ex. 1012, 4:30-33.

The incline motor 36 is also controlled by signals from the controller 28. The incline motor 36 can be a stepping motor controlled by controller signals that are pulses. It can also be an AC or DC motor 36 wherein the control signals from the controller 28 cause voltages of appropriate levels to be applied to the incline motor 36 for specified periods of time. For example, a conventional treadmill incline mechanism can be used wherein a control signal activates a relay to apply power to a fractional AC motor until the grade is incremented by the desired amount. **In this manner, the controller 28 provides one or more signals that determine the grade of the drive roller 21 and thereby the resistance level of the second resistance mechanism 15.** Additionally, **a braking system can be provided in the fitness device 32 and the controller 28 can control the braking system using control signals.**

Ex. 1012, 4:44-59.

410. Thus, Clem renders obvious these limitations.

* * *

411. Given the above, Clem renders obvious Claims 1 and 29.

E. Claims Dependent on Claims 1 and 29

1. Claim 3

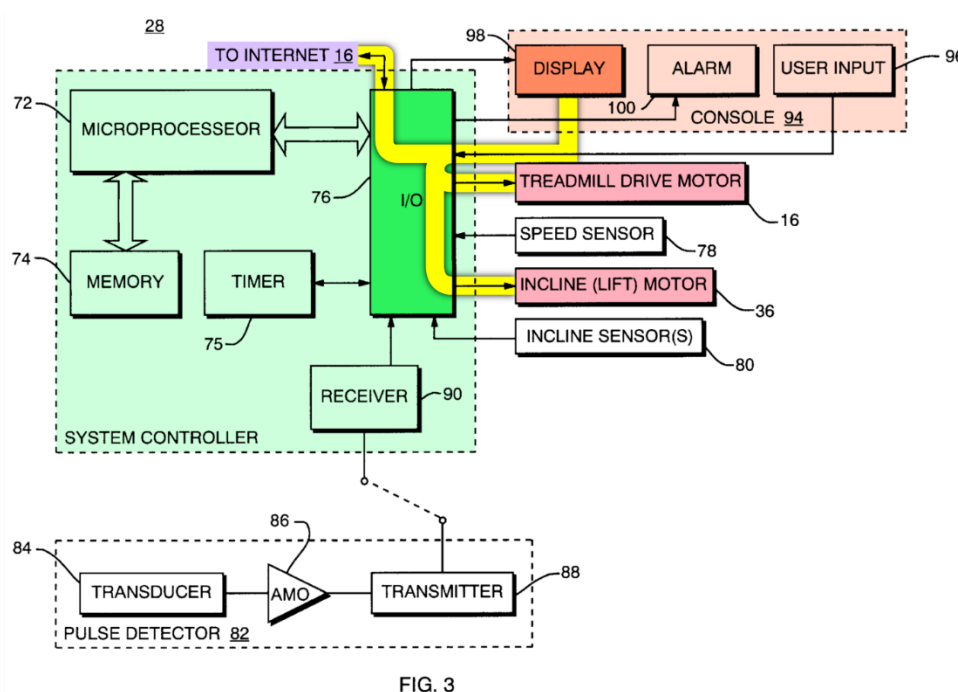
[3] An exercise device as recited in claim 1, wherein the packetized second signal comprises a signal selected from the group consisting of an audio signal, a visual signal, and a control signal.

412. Clem teaches a user “can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication.” Ex. 1012, 2:33-57. This communication can include “the uploading and downloading of video and audio information” (Ex. 1012, 2:33-65) and can “be transmitted between the fitness device 32 and the web site 12 at any time, including immediately prior to an exercise session using fitness device 32 and during such an exercise session. Ex. 1012, 2:48-52.

413. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 12-13. I have been instructed by counsel to interpret “consisting of” the same way.

414. As explained above with respect to Clem’s disclosure of Limitations [1.3]/[29.3], the signals that can be received from the remote source include audio information (“*audio signal*”), video information (“*visual signal*”), and “control signals for directly [and indirectly, though a control program] controlling the

fitness device,” including, for example, controlling the motors of the treadmill (“a control signal”). Ex. 1012, Fig. 3, 2:53-3:7. These signals, as highlighted in yellow in Fig. 3 below, can be communicated from the web site over the internet (in purple) through the controller (and rest of communicating means) (in green) to a display (in orange) or to the motors (in pink).



Ex. 1012, Fig. 3 (annotated)

415. Furthermore and as I explained above with respect to Limitations [1.3]/[29.3], Clem teaches the packetized second signal in the form of a control signal. Clem teaches that the web site can include control signals for directly controlling the fitness device or indirect control signals by sending a “fitness

equipment control program” that the controller executes which then sends a control signal to control the motors according to the program.

The control information transmitted from the web site 12 can include control signals for directly controlling the fitness device 32. However, in a preferred embodiment of the fitness system 10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28. In this preferred embodiment the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12. Additionally, a digest of information for each user of fitness system 10 can be accumulated by the web site 12 and the control information can be determined according to the digest as well as the current user location information. For example, the web site can store a plurality of control programs and select a control program from the plurality according to the digest and the current user location information.

Ex. 1012, 2:66-3:14.

416. Clem also recognizes that the display is controlled by output signals from the microprocessor in the controller. Ex. 1012, 5:15-17. Such output signals are “representative of the operation of the microprocessor in the controller” and thus can be interactively transmitted between the user location and web site through input/output circuit that is coupled to the internet. Ex. 1012, 5:17-23.

417. Clem teaches that these visual, audio, and control signals can be sent as a signal (“*second signal*”) as the user can interact with the fitness experts and receive control information.

The user **can also interact with fitness experts on-line and** provide exercise information and **receive control information** wherein the received control information can permit interaction between the fitness server device and the user.

Ex. 1012, 2:17-21.

418. A POSITA also would have understood that because these signals are is delivered via the Internet, which is a packet-based networking system, the treadmill would be receiving packetized control signals from the web site. *See* Ex. 1012, Figs. 1, 3, 2:40-42, 3:33-64, 5:17-23, cl. 11. Said differently, the control information that controls the treadmill (either the motors in the treadmill or the display) and is received over the Internet in a packetized form, is a “packetized control signal” as claimed.

419. Thus, Clem renders obvious that the packetized second signal “*comprises a signal selected from the group consisting of an audio signal, a visual signal, and a control signal.*”

420. To the extent “consisting of” is a so-called “closed group,” Clem renders this limitation obvious. It would have been obvious for Clem’s second signal to be selected from the group containing only an audio, visual, and control signal. A POSITA would have understood that these three signal types were one of only a few possible design choices that would have been obvious to try. Ex. 1005, 2:58-67

421. Thus, Clem renders obvious this limitation.

2. Claim 4

[4] An exercise device as recited in claim 1, wherein the control signal is synchronized with at least one of the audio signal and the visual signal.

422. Clem in view of Hickman renders obvious this limitation.

423. As I discussed previously, Clem teaches that the packetized control signals are sent over via the internet from the web site through the controller to the console. See Ground 2 Limitations [1.3]/[29.3], and [85.3].

424. Clem also discloses the communication of video and audio signals to the console (as I discussed previously regarding Claim 3 and incorporate here) which allows the user to engage in a real time two way communication with the remote web site. Likewise, the controller receives controlling signals from the web site.

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12

to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment. For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12. **The communication can include the uploading and downloading of video and audio information.**

Ex. 1012, 2:53-65.

The **control information transmitted from the web site 12 can include control signals for directly controlling the fitness device 32.** However, in a preferred embodiment of the fitness system **10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28.** In this preferred embodiment **the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12.** Additionally, a digest of information for each user of fitness system 10 can be accumulated by the web site 12 and the control information can be determined according to the digest as well as the current user location information. For example, **the web site can store a plurality of control programs and select a control program from the plurality according to the digest and the current user location information.**

Ex. 1012, 2:66-3:14.

425. Clem teaches that the “output” signal is shown on the display of the console.

The output signals of the microprocessor 72 also control the display 98 which can be located on a console 94 of the exercise equipment 32. It will be understood **that information representative of the operation of any of the devices included in the controller 28 can be interactively transmitted 20 between the user location 34** and the web site 12 **by way of I/O circuitry 76** which is coupled to the internet system 19 by way of interface 22.

Ex. 1012, 5:16-23.

426. Clem teaches that “the user can also interact with fitness experts on-line and ... receive control information.” Ex. 1012, 2:17-21. It also teaches that, “in addition” to the video and audio communication from the trainer, the user “can interactively obtain the control information from a computer located at the web site 12.” Ex. 1012, 2:60-64. Thus a POSITA would have understood the treadmill can receive synchronized video, audio, and control signals at the same time.

427. If a user was interacting with a live expert in real-time thus requiring the treadmill to receive audio and video signals from the web site (as discussed in Ex. 1012, 2:53-65), the live expert would have been able to control the speed or incline as discussed in Clem. Ex. 1012, 2:66-3:14. Thus Clem renders this

limitation obvious as the treadmill could simultaneously receive audio and video signals with control signals from the remote source.

428. To the extent not explicitly described in Clem, a POSITA would have been motivated to adjust Clem so that the display of a visual or audio signal (as Clem discusses) is simultaneous with the signal to control the operating parameters of the exercise device (also disclosed in Clem, as discussed above). Indeed, by doing so, a POSITA would be able to improve the workout quality communicated to the user by increasing resistance while telling the user that such an increase would incur. Indeed, both Studor (as I described above) and Hickman (as described below) contemplates such a system.

429. Such a practice of having a program that provides synchronized control signals with video or audio signals was well known. For example, Shea teaches a stationary bicycle which includes a display that receives a video or audio signal regarding “the proper way of performing the particular exercise” while also changing the difficulty level of the exercise, including the resistance. These signals in Shea were sent from a remote source (central computer).

In some cases, **the exercise description may include data for generating a video, graphical and/or animated display (along with accompanying audio, if desired) regarding the exercise. This display and accompanying audio may be communicated to the exerciser using the display and speakers of the exercise terminal.**

The display and audio may indicate the proper way of performing the particular exercise, the muscles or muscle groups worked during the exercise, etc.

Ex. 1019, 15:13-22.

Thus, if the processor of an exercise terminal monitors that the patient's pulse rate was generally below the first pulse rate during one or more previous exercises or workouts, **the system control program or the fitness consultant may subsequently automatically select harder exercises and workouts**. Similarly, if the patient's pulse rate generally exceeded the second pulse rate during one or more previous exercises or workouts, the system control program or the fitness consultant may subsequently select easier exercises. In situations where a patient's pulse rate must be carefully controlled, **the system control program may include a routine for automatically changing the difficulty level** and/or exercise time during exercise if the patient's pulse rate is too high or too low. Such changes may be stored in the exercise database and utilized by the system control program or fitness consultant in the subsequent selection of exercises and workouts.

Ex. 1019, 25:38-54.

Processor 201 **generates control signals supplied over line 34 for controlling the exercise level of stationary bicycle 200** in accordance with an exercise program selected from ROM 203 (or from a portable memory module, if provided, as mentioned above)

and corresponding exercise program parameters (e.g., total exercise time, difficulty level). If desired, exercise programs for one or more of the exercise apparatus terminals in the exercise terminal network may be stored in the memory of central computer 102. In this case, exercise programs are also selectable from the memory of central computer 102.

Ex. 1019, 6:61-7:4.

430. As discussed by Mr. Rutberg in his declaration, a POSITA would have been motivated to synchronize the audio/visual signals with the control signals in Clem because doing so would allow the trainer to provide instructions based on the treadmill operating parameters the user was experiencing. Rutberg Decl. ¶¶ 123-126. As I understand from Mr. Rutberg, such instructions make the workout more effective and safe. Having synchronized signals can also allow for a simulated natural environment, which can improve a user's motivation to workout. Rutberg Decl. ¶¶ 79-82, 125.

431. In addition, the Clem-Hickman combination renders obvious the claimed synchronized control and audio/visual signals. Hickman includes a “communication tool by a human personal trainer” remote from the exercise system. It can “download new exercise scripts or programs to the local system computer” which while also having the personal trainer associated with the remote system provide vocal instructions or encouragement while the user performs the

workout. Such instructions can be simultaneous, as the script can include audio for telling the user that they are “approaching a hill” and that there will be an “increased resistance” while accompanied by a control signal increasing the resistance.

The remote system computer is preferably associated with a number of exercise and health locations. **The remote system computer can be considered to be the communication tool of a human personal trainer**, as opposed to the “virtual personal trainer” emulated by software in the local system computer. For example, the remote system computer can be associated with one hundred local systems (used by one or more individuals in, for example, their homes), and can be used to upload information from the exercise and health equipment of a local system to be analyzed by the personal trainer at the remote computer. The personal trainer can then call the individual user to provide additional instruction, encouragement, and cautions, and **the remote system computer can download new exercise scripts or programs to the local system computer** to implement these changes.

Ex. 1013, 2:31-45.

The loudspeaker 58 provides another important communication medium to the user of the stationary bicycle 18. For example, under computer 24 control, **the user can be told with either a digitally synthesized or digitally recorded voice to pedal faster, pedal slower, that they are doing a good job, etc.** Of course, analog

recording techniques can be used as well, but are considered to be less flexible and desirable. Preferably, **the voice being used is that of the personal trainer associated with the remote system 14 that oversees that local system 12**. Both voice synthesis and digital voice recording on computer systems 24 are well known to those skilled in the art.

Ex. 1013, 5:6-18.

Next, in a step 140, it is determined if a script preview should be provided. If yes, a **step 142 provides an auditory, visual or other type of preview of upcoming script events**. For example, the system 12 could be taking a user on a imaginary bicycle ride through the country. **The script preview would then, in a step 142, indicate something like “We are now approaching a hill. You will note an increased resistance to pedaling in a few seconds which will steadily increase until we reach the crest of the hill in about one and a half minutes.”** These steps 134, 138, and 142 are further examples of the local system 12 serving as a “virtual personal trainer.” The process 116 is completed at step 144.

Ex. 1013, 9:4-15.

432. Thus Clem in view of Hickman renders obvious “*the packetized control signals are synchronized with at least one of an audio signal or a video signal*” as recited in the claim.

3. Claim 5

[5] An exercise device as recited in claim 3, wherein a trainer promulgates the control signal.

433. I note that Claim 5 does not recite what type of trainer is required. The '062 Patent discloses that the “trainer” could either be “live” or “stored.” '062 Patent, 4:10-12. The '062 Patent further explains that a “live trainer” is a “human being,” while a “stored trainer” can be “e.g., a website, video, disk, or dynamic or interactive software program.” '062 Patent, 3:65-4:3. Because Claim 5 recites a “trainer” without specifying the type, a POSITA would understand that either a “live” or “stored” trainer would suffice.

434. Clem renders obvious an exercise device as recited in Claim 3 where the user interacts with a trainer in real-time. In particular, Clem teaches that the user can “interact on-line with a live fitness expert [(“*trainer*”)] located at the web site 12 to engage in a real time two way communication.” Ex. 1012, 2:53-57. It further teaches that the user can receive “control information” from the fitness expert on-line. Ex. 1012, Abstract, 2:17-21 (“The user can also interact with fitness experts on-line and provide exercise information and receive control information wherein the received control information can permit interaction between the fitness server device and the user.”) Clem also teaches that the trainer

at the web site can promulgate control signals (either directly or indirectly) as described regarding Claim 3.

435. To the extent Clem does not explicitly teach this limitation, a POSITA would have understood that the trainer can promulgate a control signal from the web site, given that the trainer is interacting with the user and the web site can promulgate a control signal.

436. A POSITA would have been motivated to have the trainer that is interacting in real-time with the user also control the speed and/or grade of the treadmill through the web site. As discussed, the web site is able to remotely control the grade and/or speed of the treadmill by sending control signals. Ex. 1012, 2:66-3:14. Likewise, the live fitness expert can engage in real time communication regarding matter related to fitness, including “exercise equipment.” Ex. 1012, 2:53-57. Thus a POSITA would have been motivated to allow the fitness expert to directly promulgate a control signal for the exercise equipment so that they could properly convey the desired treadmill parameters.

437. A POSITA would have been motivated to use a trainer who promulgates the control. First, Clem expressly teaches using a trainer who interacts with the user in real time regarding exercise equipment and routines. Ex. 1012, 2:46-64. Second, a POSITA would have recognized the convenience of automating that process, and would have further recognized that Clem’s system already had

the communication and processing components necessary to do so, and therefore no additional components or equipment were necessary. Third, implementing a live trainer control signal was well within the capabilities of a POSITA as demonstrated by Studor's teachings of using a spinmaster or coach. Fourth, as stated by Mr. Rutberg, a POSITA would want the trainer to promulgate a control signal because the trainer could want to change the speed/incline of the treadmill to improve the user's workout. Rutberg Decl. ¶¶ 88-90, 127-129.

438. Given these reasons, a POSITA also would have been motivated to incorporate Hickman into Clem. Hickman teaches that "[t]he remote system computer can be considered to be the communication tool of a human personal trainer" where the training "script can be influenced not only by the local station 12, but also by the human personal trainer at the remote system computer 66." Ex. 1013, 2:31-45, 7:49-8:14. Hickman further explains that the "script therefore provides a general framework of a desired exercise session which can be varied based upon human personal trainer input from remote system 14, user input at local station 12, and detected user performance at local station 12." Ex. 1013, 7:49-8:14.

439. Thus, Clem in view of Hickman renders obvious a trainer promulgates the control signal.

4. Claims 8 and 30

[8] An exercise device as recited in claim 1, wherein the interface means is selected from the group consisting of: (i) one or more audio input devices; and (ii) one or more video output devices.

[30] An exercise device as recited in claim 29, wherein the at least one user interface device is selected from the group consisting of one or more audio input devices and one or more video input devices.

440. Clem teaches that a console having a user input and a display. Ex. 1012, Fig. 3. As previously discussed, a POSITA would have understood that this console with user input and a display is the interactive interface discussed claim 23 of Clem. Ground 2 Limitations [1.2]/[29.2].

441. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 14-16, 31-32. I have been instructed by counsel to interpret “consisting of” the same way.

442. Clem describes an exercise device that permits a user at the user location “to interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication.” This communication “can include the uploading and downloading of video and audio information.” Though not explicit, a POSITA would understand that the console (“*interface means*”/“*user interface device*”), which Clem states includes a “user input,” includes one or more audio input and one or more video input to permit real time two way communication of audio and video information. This is the most likely, and only

location shown in Fig. 3 of Clem, for the user to input the video and audio information for the communication with the trainer.

443. A POSITA would be motivated to add audio and video inputs into the Clem user interface.

444. **First**, Clem included a two way communication with the remote web site using video and audio data, which requires a video and audio input from the user. Without audio input and video input devices, a POSITA would not be able to perform the discussed two way audio video communications between user and fitness trainer. As such, a POSITA would have known and would have been motivated to add one to the extent it is not already disclosed by Clem.

445. **Second**, such video and audio inputs were commonplace to a POSITA and thus a POSITA would know to include one. Indeed, “video conferencing” into an exercise system was an “increasingly common technology.” Ex. 1005, 15:49-53. For example, Studor taught “incorporating video-conferencing” into an exercise device, which requires an interface device for the user to input both video and audio. Ex. 1005, 15:49-53; *See* Ground 1 Limitations [8]/[30] (discussing Studor’s teaching of video and audio input). Likewise, U.S. Patent No. 6,430,997 (“French”) described using “cameras or other image capturing devices” to capture images of an exerciser so that an image analysis can be performed. Ex. 1015, 10:46-53. Thus, the inclusion of audio and video input devices into Clem to permit

the two-way video and audio communication discussed in Clem was well within the knowledge of a POSITA at the relevant time. Similarly, U.S. Patent No. 5,785,630 (“Bobick”) explained that “a microphone can be electrically coupled to the computer and located in/on the computer, in/on the display(s), or elsewhere on the exercise machine” to “allow for both voice and data communication between the users.” Ex. 1008, 15:4-11.

446. **Third**, as Mr. Rutberg states, a POSITA would have been motivated to include audio and video input devices into Clem because it would have allowed the trainer to identify whether the user is using correct exercise techniques and to gauge user effort levels. Rutberg Decl. ¶¶ 56-58, 114-115. Also, having an audio input device would allow the user to communicate pain that is not visible. Rutberg Decl. ¶ 116.

447. Clem also teaches a “display” that is found on the console. Ex. 1012, Fig. 3.

448. Clem teaches that the “output” signal is shown on the display of the console.

The output signals of the microprocessor 72 also control the display 98 which can be located on a console 94 of the exercise equipment 32. It will be understood that information representative of the operation of any of the devices included in the controller 28 can be interactively transmitted 20 between the user location 34

and the web site 12 by way of I/O circuitry 76 which is coupled to the internet system 19 by way of interface 22.

Ex. 1012, 5:16-23.

449. While not explicit, a POSITA would have understood that the display on the console in Clem would have contained one or more video output devices as well as an audio output device. As discussed above, Clem discloses two way audio and video streaming between the remote web site and the user. As shown by Fig. 3 below, the display (in orange) receives signals (in yellow) from the web site over internet (purple) through the controller (and other parts of the communicating mechanism not picture) (in green). Ex. 1012, 5:15-23. Thus to play the video and audio streaming from the web site, the display would need to have a video and audio output.

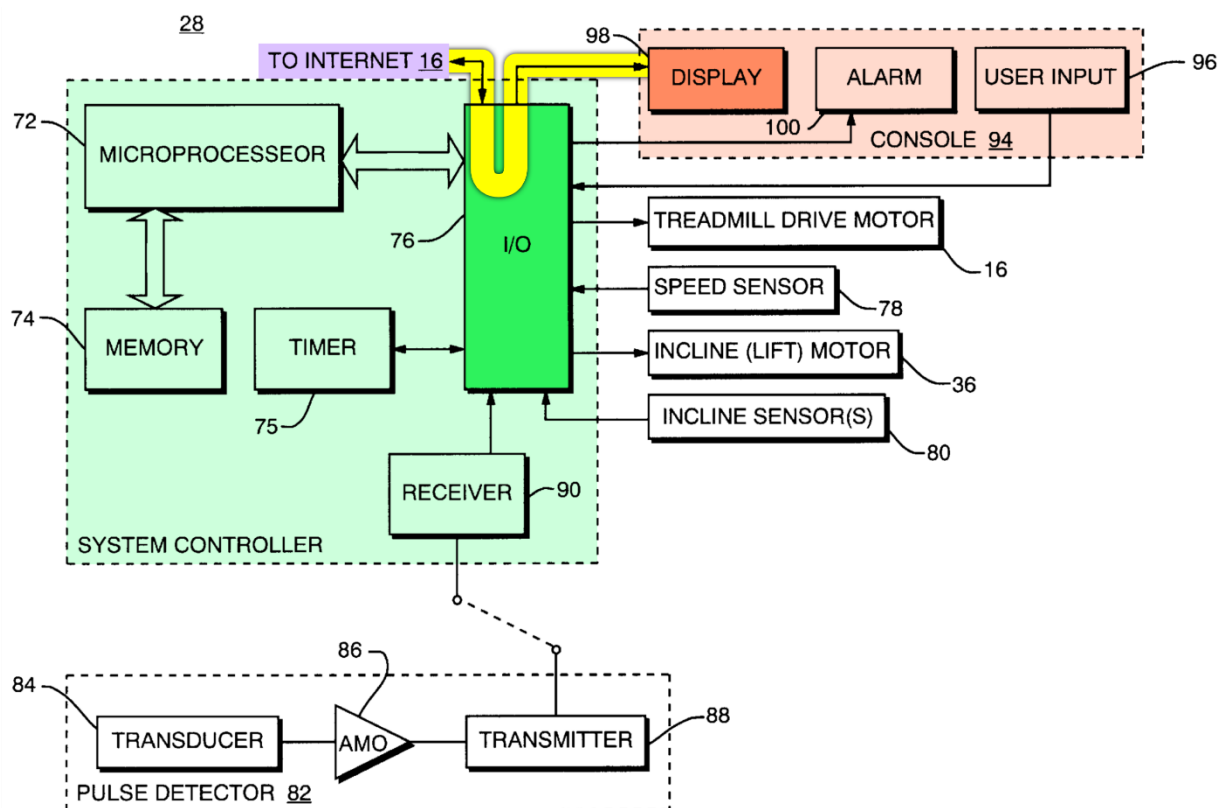


FIG. 3

Ex. 1012, Fig. 3 (annotated)

450. A POSITA would have understood that the display would include a video output to display the video included from the “uploading and downloading of video and audio information” from the “real time two way communication” between a live fitness expert at the web site and the user, since (1) displays were known to output information for consumption by a viewer, such as video and audio information, and (2) Clem describes receiving video information and the display is the most likely location for viewing this information. Ex. 1012, 2:53-65. Indeed, displays on consoles were well-known. *See* Ex. 1019, Fig. 4, 5, 7, 4:24-35.

451. Further, an exercise device with audio and video outputs was within the knowledge of a POSITA.

452. For example, as I discussed above, Studor disclosed this type of display and audio outputs.

453. Similarly, Shea taught an exercise device having a “[d]isplay 206” which “includes, for example, a cathode ray tube (CRT), light emitting diodes (LEDs) and/or liquid crystal displays (LCDs) and is responsive to signals from processor 201 for displaying various information to the exerciser ...as is known in the art.” Ex. 1019, 7:5-12. These displays include a “display portion 303” that could be a display portion such “such as an LED display screen, a liquid crystal display screen or a CRT screen for displaying video, textual and/or graphical information to an exerciser.” Ex. 1019, 9:53-57. Shea also teaches a “speaker 208 responsive to processor 201 for providing audible sounds to the exerciser.” Ex. 1019, 7:14-16. These speakers and displays were found on the console of the exercise device. Ex. 1019, Figs. 4, 5, 7, 4:24-35. And, like Clem’s teaching of a live fitness expert communicating regarding an “exercise routine” being conveyed to the user, Shea teaches that the “display and accompanying audio may be communicated to the exerciser using the display and speakers of the exercise terminal,” and may “indicate the proper way of performing the particular exercise.” Ex. 1019, 15:17-22.

454. A POSITA would have been motivated to implement an audio and video output device into the console in Clem because it would allow the listening/viewing of audio and video communications from the user during a workout as discussed in Clem. Ex. 1012, 2:48-66; Rutberg Decl. ¶¶ 68-71, 118-122. In addition, as Mr. Rutberg states, having the audio and video output device would allow the user to see a proper demonstration of form by the trainer. Rutberg Decl. ¶¶ 70, 119. In addition, a video display allows the user to see the trainer, providing a more personal touch that is appreciated by the user. Rutberg Decl. ¶¶ 69-70, 119. And having an audio output would allow the user to receive signals even if not looking at the device or if visually impaired. Rutberg Decl. ¶¶ 68-71, 120-122.

455. Clem in view of Hickman renders obvious this limitation. Hickman describes that the computer includes both “an output on a display 56 that can be viewed by an individual user sitting” on the bicycle seat. Ex. 1013, 4:63-64. “This display can be a simple light display ... or it can be a full video display.” Ex. 1013, 4:65-66. The preferred embodiment is a full video display to provide “instructions and encouragement to a user of the stationary bike” and can include an image of the human personal trainer “who is in charge of the remote system 14.” Ex. 1013, 4:66-5:5. As such, a POSITA would have understood that Clem’s communication

from a live fitness expert at the web site could be displayed on the display as taught in Hickman.

456. To the extent “consisting of” is a so-called “closed group,” Clem renders this limitation obvious. It would have been obvious for a POSITA to try a user interface containing only an audio input device and a video output device. It also would have been obvious to try a user interface with only an audio input device and an video input device. Components such as microphones, cameras, and display screens were well known components and each one of only a few design choices for a user interface, and were well within a POSITA’s knowledge.

457. Thus Clem in view of Hickman renders obvious “*the interface means is selected from the group consisting of: one or more audio input devices; and (ii) one or more video output devices*” as recited in Claim 8.

458. Thus, Clem renders obvious “*the at least one user interface device is selected from the group consisting of one or more audio input devices and one or more video input devices*” as recited in Claim 30.

5. Claim 9

[9] An exercise device as recited in claim 1, wherein the interface means comprises one or more controllers.

459. Clem renders obvious “*the interface means comprises one or more controllers.*”

460. As I discussed regarding Limitations [1.2]/[29.2], Clem's interface means includes an interactive interface on the console where the user can input information. Ex. 1012, Fig. 3, cl. 23. Such information that can be communicated by the user include the selection of command programs that can control the "speed, incline and suspension" of the treadmill. Ex. 1012, 3:1-7, 3:46-48. Clem discusses having a user input and such types of user input in the interface were commonly known. *See* Ground 2 Limitations [1.2]/[29.2] (discussion regarding interface), [49.2], and [50] (discussions regarding commonality of user input on consoles for speed and incline of treadmills). The '062 patent itself recognized that the claimed controller in the interface means can include "switches, rheostats, potentiometers, touch sensitive controls, voice activated controllers, and the like." Thus such switches or touch sensitive controls at the console to control the resistance (as was well-known in the art, as I discuss below regarding Claim 50) are controllers according to the '062 patent.

In addition, **each controller, button, and the like may take the form of one or more switches, rheostats, potentiometers, touch sensitive controls, voice activated controllers, and the like.** The input devices described herein **are examples of structures capable of performing the function of interface means for gathering a first signal (such as a real time signal) from the user.** One skilled in the art may identify various other configurations of interface means that

are capable of performing the desired function. Additionally, it may be appreciated that treadmill 20 may also include such interface means.

Ex. 1001, 9:33-43.

461. Although Clem does not explicitly disclose a controller in the user interface, a POSITA would have understood that “an interactive interface ... wherein commands related to the database can be entered” requires a controller. Ex. 1012, cl. 23. Otherwise, the commands would be unable to be effectuated.

462. Further, having a controller in the user interface was within the knowledge of a POSITA, as shown by Studor, as I explained previously, and the switches or touch sensitive controls at the console to control the resistance, as I discuss below regarding Claim 50.

463. Likewise, Andrus describes an exercise machine 22 which includes an exercise computer 68, which is a Motorola brand 68HC05 microcontroller.” Ex. 1016, 8:60-62. This computer interfaces with a control panel that includes a keypad for accepting user input. Ex. 1016, 9:24-34. This input can include determining the load resistance imposed on the user. Ex. 1016, 9:24-34.

464. A POSITA would have been motivated to implement a controller into the interactive interface in Clem because it would permit the user to control their

workout and provide information to the web site, as is contemplated by Clem. Ex. 1012, Fig. 3, 2:34-3:21.

465. Hickman also teaches such a controller in the user interface. Hickman teaches a local station having a computer (“*interface means*”) which “can control and monitor the various functions of the stationary bicycle 18.” Ex. 1013, 4:43-45. As such, Hickman teaches an interface means having a controller.

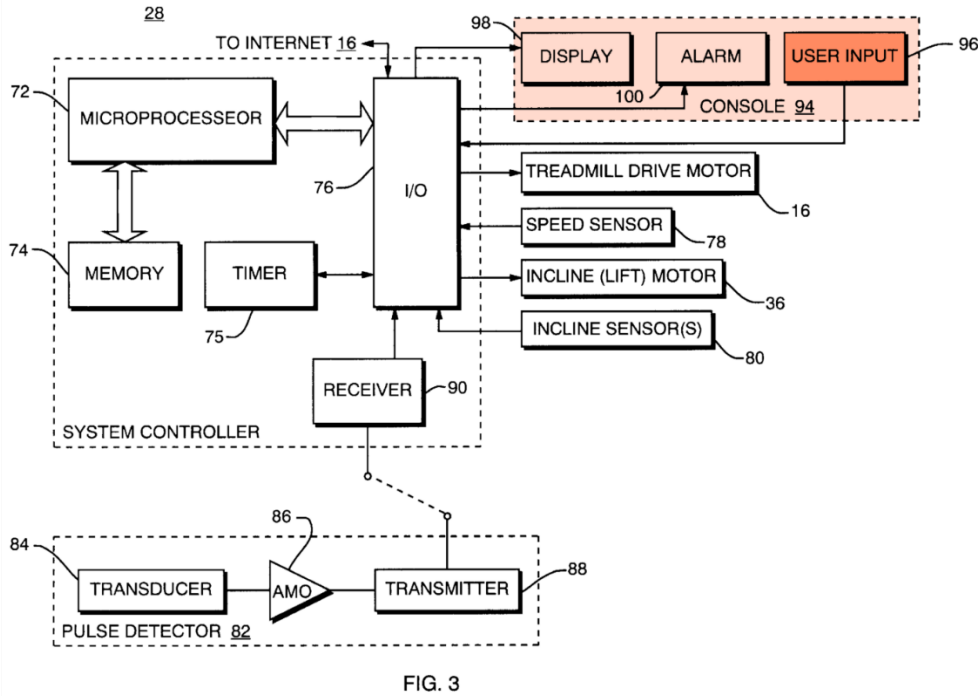
466. Thus, Clem renders obvious “*the interface means comprises one or more controllers*” as recited in Claim 9.

6. Claim 10

[10] An exercise device as recited in claim 1, wherein the interface means comprises a video camera integrally formed with the exercise device.

467. Clem renders obvious that the user interface (as described above re-Limitations [1.2]/[29.2]) (“*the interface means*”) comprises *a video camera integrally formed with the exercise device.*”

468. Clem teaches that console includes a user input (highlighted in orange).



Ex. 1012, Fig. 3 (annotated)

469. As previously discussed, a POSITA would have understood the console, including the user input section, would have been where the user input and received the two way real time audio and video communications with the fitness expert at the web site.

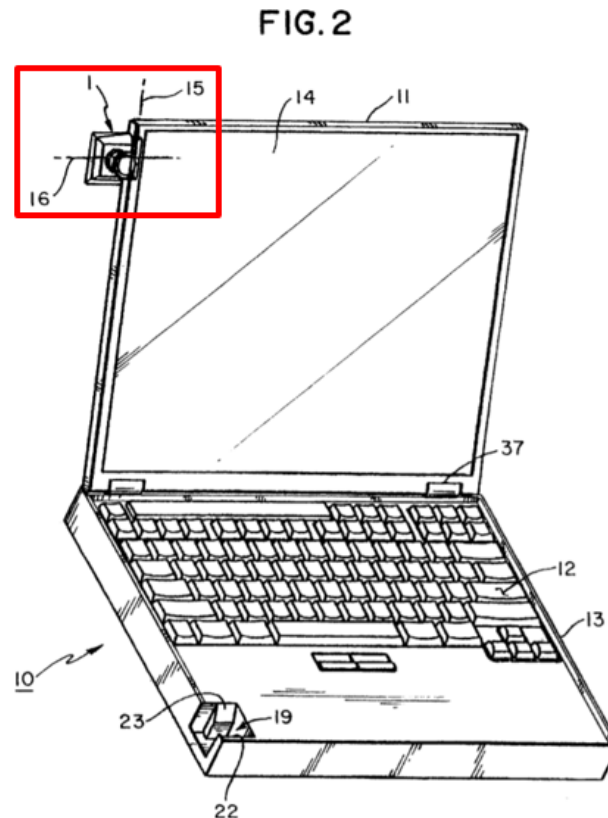
470. A POSITA would have understood that a system implementing common video conferencing capability (as is described in Clem as “real time two way communication” that includes “uploading and downloading of video and audio information” (Ex. 1012, 2:53-65)) would require an audio input device, such as a microphone, and a video input device, such as a camera. As discussed previously, to enable the real time two way video and audio communication

between the remote expert and user, a POSITA would have understood that the user input requires a video input device, which confirms that the user input at the console in Clem would include a video input device integrated into the console to record video in real-time while the user is working out, as is discussed in Clem. Ex. 1012, 2:48-53 (information can be transmitted while the user is exercising; 2:54-65 (system permits video and audio two way real-time communication with trainer). Since a camera was known to be a common video input device, a POSITA would have been motivated to integrate a camera into the user input of the console in Clem.

471. The inclusion of audio and video input devices (in particular cameras) to implement the video conferencing capability discussed in Clem was well within the knowledge of a POSITA at the relevant time. For example, U.S. Patent No. 5,785,630 (“Bobick”) explained that “a microphone can be electrically coupled to the computer and located in/on the computer, in/on the display(s), or elsewhere on the exercise machine” to “allow for both voice and data communication between the users.” Ex. 1008, 15:4-11. Similarly, U.S. Patent No. 6,430,997 (“French”) described using “cameras or other image capturing devices” to capture images of an exerciser so that an image analysis can be performed. Ex. 1015, 10:46-53.

472. Moreover, U.S. Patent No. 6,587,151 (“Cipolla”) teaches integrating a video camera 16 into a laptop computer screen. Ex. 1018, title (“Video camera

integration on a portable computer”). As Cipolla explains, “[t]he invention relates to incorporating a video camera as an integrated feature of a portable computer, and in particular to the structural considerations in integrating a video camera for use and storage in a portable computer.” Ex. 1018, 1:6-10. In Cipolla’s Figure 2 embodiment, “the video camera assembly 1 [is] mounted on the cover 11 near the most extended portion of the periphery of the display 14.” Ex. 1018, 3:29-31:



Ex. 1018, Fig. 2 (annotated).

473. Thus, Clem renders obvious “*wherein the interface means comprises a video camera integrally formed with the exercise device*” as recited in Claim 10.

7. Claims 11 and 48

[11] An exercise device as recited in claim 1, wherein the communicating means enables transmission of the first signal.

[48] An exercise device as recited in claim 29, wherein the communicating mechanism enables transmission of the first signal.

474. Clem discloses these limitations.

475. The network connection device, fitness equipment interface, and controller (together, the “*communicating mechanism*”/“*communicating means*”) enables the transmission of a signal that comes from the console to a web site or third party application. This signal includes a program selection signal as well as audio/video signals from the real-time communication from the user to the trainer, both which are information conveyed via the “user input” in the console (as discussed regarding Ground 2 Limitations [1.2]/[29.2]). I further incorporate my earlier discussion regarding the signals transmitted through the communicating mechanism.

The user location 34 interactively applies and receives the interactive information to the internet system 19 by way of network connection device 18. The network connection device 18 can be a network computer, a personal computer, a cable television box, or any other suitable connection device. The user location information **transmitted by way of the network connection device 18 can include personal information**

identifying or describing the user to the web site 12. For example, in addition to a user password if desired, **the user location 34 can provide user information such as user heart rate, weight, age and gender.**

Ex. 1012, 3:34-47.

476. As shown in Fig. 3 below, the user input (orange) transmits a signal (signal shown in yellow) to the *communicating means/communicating mechanism* (in green), as I described in my discussion of Limitations [1.3]/[29.3], which then communicates the signal to the web site through the internet (in purple) to the web-site (not shown), which then sends a control signal back to the controller to control the motors (in pink).

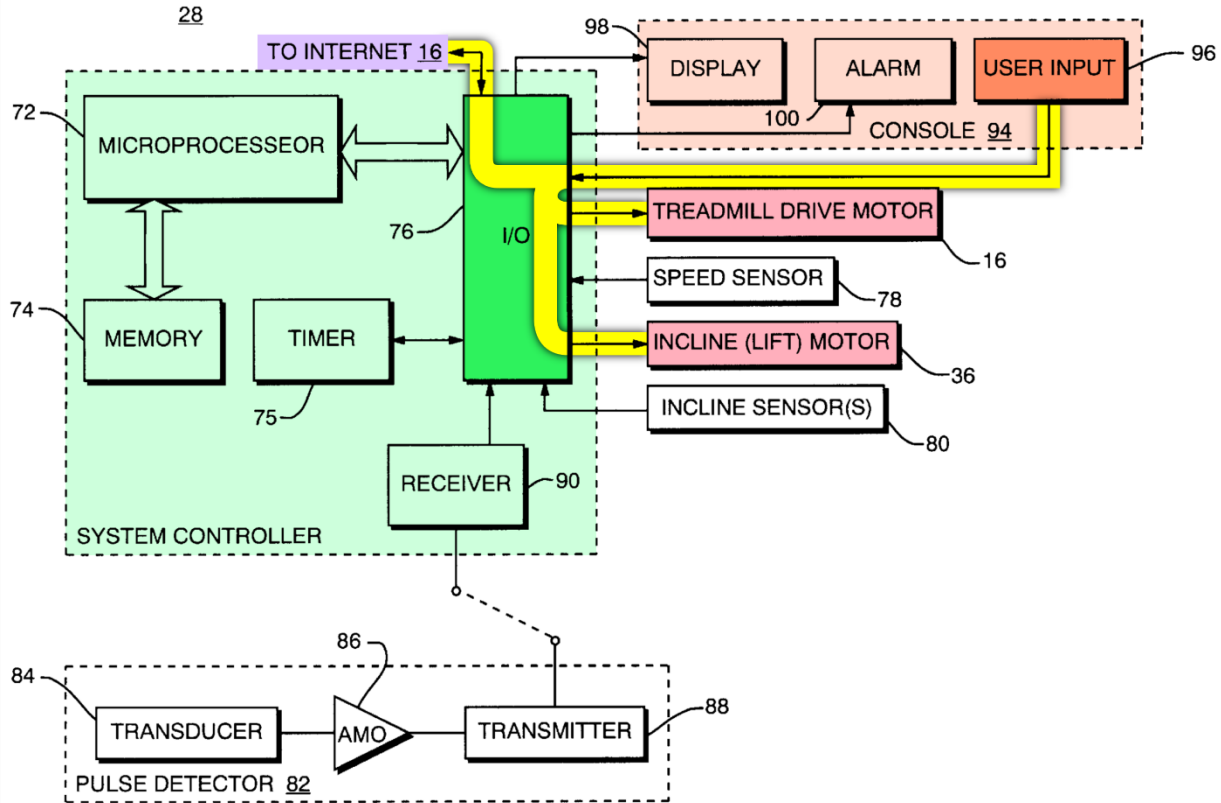


FIG. 3

Ex. 1012, Fig. 3 (annotated)

477. As discussed previously, Clem also discloses an interactive coupling to transmit a two-way communication, including real-time audio and video, regarding matters of fitness. This information is communicated through the internet system via the communicating mechanism (as described previously regarding Limitations [1.3]/[29.3]).

Referring now to FIG. 1, there is shown a schematic representation of the interactive programmable fitness system 10 of the present invention. The fitness system **10 includes a programmable fitness device 32 interactively coupled with a web site 12**. The fitness

device 32 is disposed at a user location 34 at a location that is geographically remote from the web site 12. The interactive coupling between the fitness device 32 and the web site 12 can be by way of an internet system 19. **The interactive coupling permits the fitness device 32 to transmit various kinds of user location information to the web site 12. It also permits the web site 12 to transmit control information to the user location 34 to control, for example, drive motor 16 and incline motor 36 of exercise device 32.** Thus the web site 12 can operate as a server device for the user. Information can be transmitted between the fitness device 32 and the web site 12 at any time, including immediately prior to an exercise session using fitness device 32 and during such an exercise session.

Ex. 1012, at 2:34-52

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 **to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment.** For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12. **The communication can include the uploading and downloading of video and audio information.**

Ex. 1012, 2:53-65.

It will be understood that **information representative of the operation of any of the devices included in the controller 28 can be interactively transmitted between the user location 34 and the web site 12** by way of I/O circuitry 76 which is coupled to the internet system 19 by way of interface 22.

Ex. 1012, 5:18-27.

478. Thus, Clem discloses that the network connection device, fitness equipment interface, and the controller (together, the “*communicating mechanism*”) “*enables transmission of the first signal*” as recited in the claim.

8. Claim 15

[15] An exercise device as recited in claim 1, wherein the communicating means communicates with a communication system that is configured to generate one or more second signals.

479. Clem teaches a “network connection device 18,” “fitness equipment interface 22,” and “controller 28” (together the “*communicating means*”) as I explained above with respect to Limitations [1.3]/[29.3].

480. Clem teaches that the “web site can operate as a server device for the user” and that the user “can interactively obtain control information from a computer located at the web site.” Ex. 1012, 2:47-48, 2:60-64. The coupling between the web site and the fitness device “permits the web site to transmit control information to the user location 34 to control for example, drive motor 16 and

incline motor 36 of exercise device 32.” Ex. 1012, 2:44-48. “Thus the web site 12 can operate as a server device for the user.” Ex. 1012, 2:47-48.

481. As shown in Figure 1 (which I have highlighted and annotated below) and described in Clem, 3:22-27, Clem describes the network connection device communicating over the internet with the web site (“*communication system that is configured to generate one or more second signals*”). The signal pathway between the controller and the remote devices (like the website or 3rd party applications) is highlighted in yellow below.

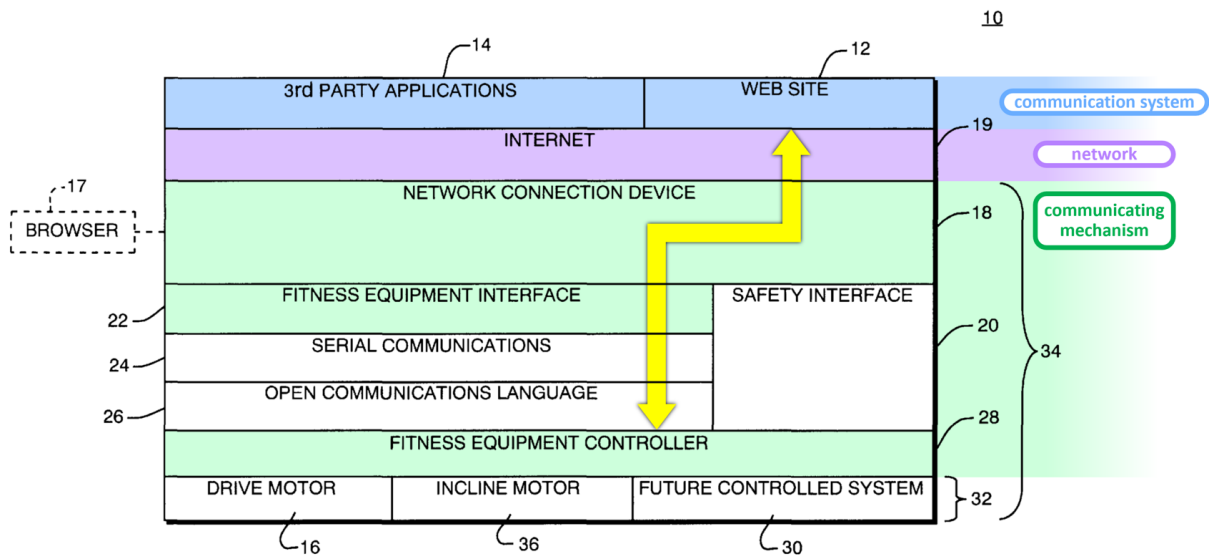


FIG. 1

Ex. 1012, Fig. 1 (annotated)

482. And as I also explained with respect to Limitations [1.3]/[29.3], Clem describes generating and sending control signals, i.e. “one or more second signals” from a computer at the remote web site through the communicating means over the

internet to the interface means. Ex. 1012, Fig. 3, 2:34-3:7. Thus, Clem's web site (and associated computer) is a "*communicating system that is configured to generate one or more second signals.*"

483. Further, Clem's "web site" is in "communication with" the "network connection device 18," "fitness equipment interface 22," and "controller 28" (together the "*communicating means*"). The specification of the '062 Patent provides a definition of *communicating with*: "any type of applicable communication known to one skilled in the art in light of the disclosure herein, such as electrical communication, optical communication, physical communication, magnetic communication, software communication, hardware communication, data communication, and the like." Even if this definition is read into the claims, a POSITA would have recognized that the "network connection device 18," "fitness equipment interface 22," and "controller 28" (together the "*communicating means*") communicates with the web site ("*communicating system*") in Clem.

484. Thus, Clem discloses that the network connection device, fitness equipment interface, and the controller (together, the "*communicating mechanism*") "*communicates with a communication system that is configured to generate one or more second signals*" as recited in the claim.

9. Claim 16

[16] An exercise device as recited in claim 15, wherein the communication system comprises memory configured to store the second signal.

485. Clem renders obvious “*the communication memory configured to store the second signal.*”

486. Clem teaches a remote web site (“*communication system*”) that “can **store** a plurality of control programs.” Ex. 1012, 3:11-14.

487. The control programs are a “*second signal*,” in that, when the control program is downloaded from the web site, “the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site.” Ex. 1012, 3:1-7. These control programs are packetized signals because they are sent online. I refer to my discussion on Limitations [1.3]/[29.3].

488. While the web site does not explicitly state that it contains memory for storing the control programs, a POSITA would have recognized and understood that because the web site can “store” control programs, it must have a memory to store these programs. Ground 1 Claim [16] (describing Studor’s memory for storing programs). For example, Shea describes a central computer with a memory for storing a database of exercise data. Ex. 1019, 3:1-4, 11:67-12:8.

489. Thus, Clem renders obvious “*the communication system comprises memory configured to store the second signal.*”

10. Claim 21

[21] An exercise device as recited in claim 1, further comprising means for reproducing the second signal.

490. Clem in view of Hickman renders obvious “*a means for reproducing the second signal.*”

491. As I explained above with respect to Limitations [1.3]/[29.3], a signal (“*the second signal*”) is transmitted to the controller from a web site. Ex. 1012, Figs. 1, 3, 2:66-3:7, 3:47-63. Given the Internet-based implementation of Clem, a POSITA would have recognized that the program stored at the web site (Ex. 1012, 3:11-14) is received by the controller via the network connection and fitness equipment interface (Ex. 1012, Fig. 1, 3:22-25, 3:33-43) and would then be used to control various aspects of the exercise equipment like the incline and drive of the treadmill by controlling the incline 36 and drive 16 motors. Ex. 1012, Fig. 3, 2:66-3:7.

492. In particular, once the signal is received from the web site, the controller reproduces the second signal by transmitting it to either the motor or display, depending on the signal. Ex. 1012, Fig. 3, 2:66-3:7. Fig. 3 below shows

how the signal (in yellow) comes from over the internet (purple) to the controller (green) and then is reproduced to the motors (pink).

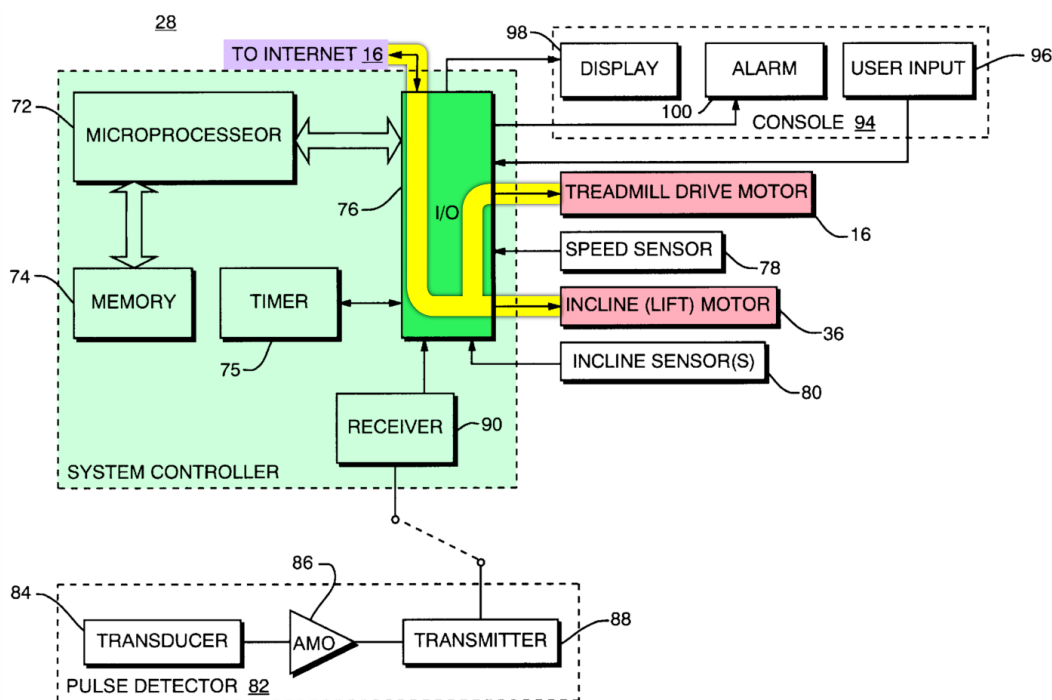


FIG. 3

Ex. 1012, Fig. 3 (annotated)

493. Likewise, a POSITA would have recognized that the real time video and audio information sent from the web site during a real time two way communication with the user (part of the “*the second signal*”) is sent to the controller, which then reproduces that signal at the display. Indeed, the “output signals of the microprocessor 72 also control the display 98 which can be located on a console.” Ex. 1012, 5:15-17. In addition, “information representative of the operation of any of the devices included in the controller 28 can be interactively

transmitted between the user location 34 and the web site 12 by way of I/O circuitry 76 which is coupled to the internet system 19 by way of interface 22.” Ex. 1012, 5:18-23. As shown in Fig. 3 below, the signal comes from the website over the internet (purple) through the controller (green) and is reproduced at the display on the console (orange).

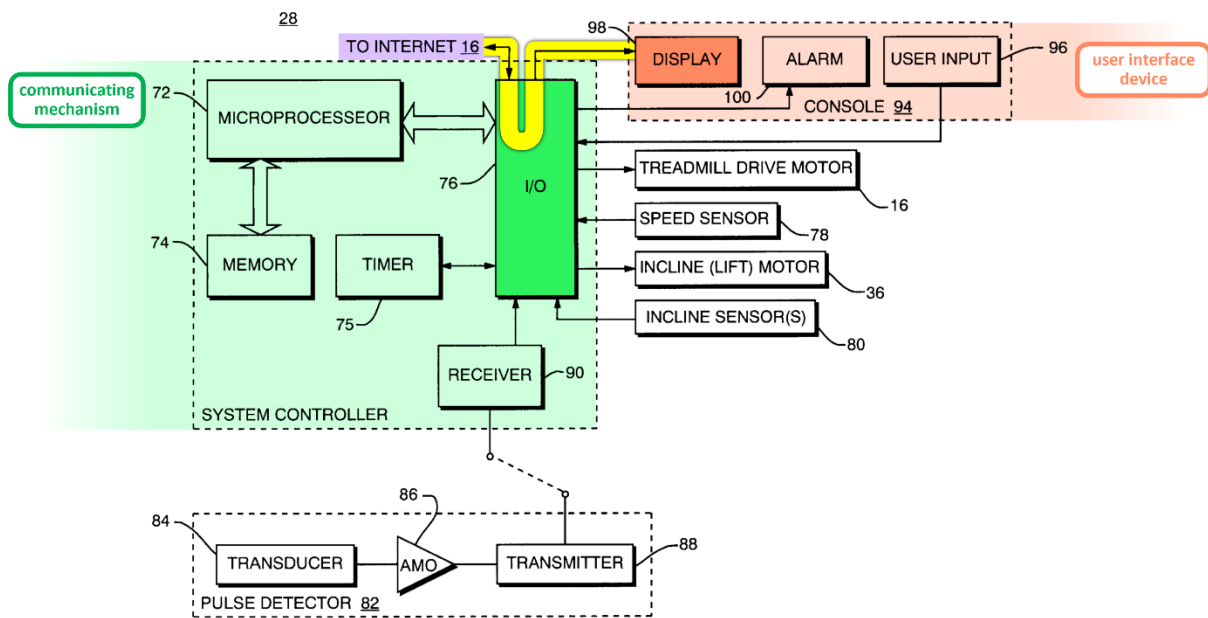


FIG. 3

Ex. 1012, Fig. 3 (annotated)

494. A POSITA would have understood that the display is part of the means for reproducing the second signal and is where the user would be able to view the video and audio information received from the web site during the real time two way communication with the fitness expert at the web site. The most convenient and likely place described by Clem for viewing audio and video

information at the user's site is the display found on the console. And a display was known to a POSITA as being a device where something can be viewed or consumed. As such, a POSITA would have understood that the video and audio information sent from the web site during a real time communication would be reproduced by both the controller and then by the display on the console.

495. Hickman teaches this limitation. In particular, Hickman describes a local computer with a full video display and loudspeaker which are both used to reproduce signals from the remote system. Ex. 1013, 4:63-5:17.

496. Thus, Clem in view of Hickman renders obvious “*means for reproducing the second signal.*”

11. Claim 22

[22] An exercise device as recited in claim 21, wherein the means for reproducing the second signal comprises one or more audio output devices and one or more video output devices.

497. Clem in view of Hickman renders obvious this claim limitation.

498. As explained above with respect to Claim 21, a POSITA would have understood that the display reproduces video and audio information (part of “*the second signal*”) after receiving it from the website and controller.

499. While not explicit, a POSITA would have understood that the display on the console in Clem would have contained one or more audio and video output devices. As shown by Fig. 3 (and as I discussed regarding Claims 8/30 and 21), the

display receives signals from the controller from the internet. Ex. 1012, 5:15-23. A POSITA would have understood that these signals include the “uploading and downloading of video and audio information” from the “real time two way communication” between a live fitness expert at the web site and the user, since (1) displays were known to output information for consumption by a viewer, such as video and audio information, and (2) Clem describes receiving video information and the display is the most likely location for viewing this information and only location shown in Fig. 3. Ex. 1012, 2:53-65. Indeed, displays on consoles were well-known. *See* Ex. 1019, Fig. 4, 5, 7, 4:24-35.

500. Further, an exercise device with audio and video outputs was within the knowledge of a POSITA.

501. For example, as I discussed above, Studor disclosed this type of display and audio outputs. Ground 1 Claim 22.

502. Similarly, Shea taught an exercise device having a “[d]isplay 206” which “includes, for example, a cathode ray tube (CRT), light emitting diodes (LEDs) and/or liquid crystal displays (LCDs) and is responsive to signals from processor 201 for displaying various information to the exerciser ...**as is known in the art.**” Ex. 1019, 7:5-12. These displays include a “display portion 303” that could be a display portion such “such as an LED display screen, a liquid crystal display screen or a CRT screen **for displaying video,** textual and/or graphical

information to an exerciser.” Ex. 1019, 9:53-57. Shea also teaches a “speaker 208 responsive to processor 201 **for providing audible sounds to the exerciser.**” Ex. 1019, 7:14-16. These speakers and displays were found on the console of the exercise device. Ex. 1019, Figs. 4, 5, 7, 4:24-35. And, like Clem’s teaching of a live fitness expert communicating regarding an “exercise routine” being conveyed to the user, Shea teaches that the “display and accompanying audio may be communicated to the exerciser using the display and speakers of the exercise terminal,” and may “indicate the proper way of performing the particular exercise.” Ex. 1019, 15:17-22.

503. A POSITA would have been motivated to implement an audio and video output device into Clem because it would allow the viewing of audio and video communications from the user during a workout as discussed in Clem. Ex. 1012, 2:48-66. As discussed by Mr. Rutberg, a POSITA would have been motivated to include video and audio output devices because it would allow the trainer to provide visual instructions and give a more personal touch to the workout. Rutberg Decl. ¶¶ 68-71, 117-119. Likewise, a POSITA would have included an audio output device because it would allow the user to receive instruction even if the user is visually impaired or looking away from the display. Rutberg Decl. ¶¶ 120-122. Mr. Rutberg also recognized that including an audio

output would allow a trainer to convey instructions in an enthusiastic tone, potentially improving user's motivation. Rutberg Decl. ¶¶ 69, 120-121.

504. Clem in view of Hickman renders obvious this limitation. Hickman describes that the computer includes both “an output on a display 56 that can be viewed by an individual user sitting” on the bicycle seat. Ex. 1013, 4:63-64. “This display can be a simple light display ... or it can be a full video display.” Ex. 1013, 4:65-66. The preferred embodiment is a full video display to provide “instructions and encouragement to a user of the stationary bike” and can include an image of the human personal trainer “who is in charge of the remote system 14.” Ex. 1013, 4:66-5:5. As such, a POSITA would have understood that Clem's communication from a live fitness expert at the web site could be displayed on the display as taught in Hickman.

505. Hickman also teaches a “loudspeaker” that preferably is used to output the “personal trainer associated with the remote system 14 that oversees that local system 12.” Ex. 1013, 5:13-15. As such, a POSITA would have understood that Clem's audio communication from the trainer at the web site could be output on a speaker as taught in Hickman.

506. Thus, Clem in view of Hickman renders obvious “*means for reproducing the second signal comprises one or more audio output devices and one or more video output devices.*”

12. Claim 23

[23] An exercise device as recited in claim 21, wherein the means for reproducing the second signal comprises an output device selected from the group consisting of an audio output device and a video output device.

507. Clem in view of Hickman renders obvious this limitation.

508. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 22. I have been instructed by counsel to interpret “consisting of” the same way.

509. As I explained with respect to Claim 22, Clem in view of Hickman renders obvious the means for reproducing the second signal consisting of an audio output device and video output device.

510. To the extent “consisting of” is a so-called “closed group,” Clem renders this limitation obvious. It would have been obvious for a POSITA to try an output device containing only an audio output device and a video output device. It also would have been obvious to try a user interface with a speaker and display screen. Components such as microphones and display screens were well known components and each one of only a few design choices for a user interface, and were well within a POSITA’s knowledge.

511. Therefore, for the same reasons as above, Clem in view of Hickman renders obvious “*the means for reproducing the second signal comprises an output*

device selected from the group consisting of an audio output device and a video output device.”

13. Claim 26

[26] An exercise device as recited in claim 1, wherein the packetized second signal comprises a signal selected from the group consisting of: (i) a packetized control signal; and (ii) a packetized control signal and a signal from a communication system.

512. Clem renders obvious “*a packetized second signal comprising a signal selected from the group consisting of: (i) a packetized control signal; and (ii) a packetized control signal and a signal from a communication system.*”

513. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 22-23. I have been instructed by counsel to interpret “consisting of” the same way

514. As discussed regarding Claim 15, Clem’s web site (and associated computer) is a “*communication system.*” Ground 2 Claim [15].

515. As I explained with respect to Limitations [1.3]/[29.3], a POSITA would have understood that because the video and audio information and control signals for the motors are delivered via the Internet, which is a packet-based networking system, the controller would be receiving packetized control signals from the web site from over the internet. *See* Ex. 1012, Figs. 1, 3, 3:22-27, 3:35-38, 5:17-23. Based on this, a POSITA thus would have understood that the

packetized signals from the web site (“*communication system*”) deliver a packetized signal to control the motors of the device and provide audio and video information to the user and are delivered from the web site and interpreted and applied to the system. Ex. 1012, Fig. 3.

516. To the extent “consisting of” is a so-called “closed group,” Clem renders this limitation obvious. It would have been obvious to a POSITA to select a signal containing only (i) a packetized control signal; and (ii) a packetized control signal and a signal from a communication system. Packetized control signals for controlling the operating parameters of exercise devices were well known and one of only a small number of design choices for such a signal. For control signals sent over the Internet, it is the only possible design choice for such a signal.

517. As such, Clem renders obvious “*an exercise device as recited in claim 1, wherein the packetized second signal comprises a signal selected from the group consisting of: (i) a packetized control signal; and (ii) a packetized control signal and a signal from a communication system.*”

14. Claim 27

[27] An exercise device as recited in claim 1, wherein the packetized second signal comprises a packetized control signal and a signal from a trainer, the signal from the trainer comprising a signal selected from the group consisting of an audio signal and a visual signal.

518. Clem renders obvious “*the packetized second signal comprises a packetized control signal and a signal from a trainer, the signal from the trainer comprising a signal selected from the group consisting of an audio signal and a visual signal.*”

519. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 23. I have been instructed by counsel to interpret “consisting of” the same way.

520. As I explained with respect to Limitations [1.3]/[29.3], a POSITA also would have understood that because the motor control signals are delivered via the Internet, which is a packet-based networking system, the controller would be receiving packetized control signals from the web site. *See* Ex. 1012, Figs. 1, 3, 2:66-3:7, 3:33-64. Based on this, a POSITA thus would have understood that the packetized signals from the web site motor control signals would include a packetized control signal delivered from the web site and interpreted and applied to the system. Ex. 1012, Fig. 3.

521. Clem teaches a “visual signal” and “audio signal” from the trainer. Clem teaches that a “user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication regarding matters related to fitness.” Ex. 1012, 2:53-57. It further teaches that “[t]he communication can include the uploading and downloading of video and

audio information.” Ex. 1012, 2:64-65. Such information can be transmitted “at any time, including immediately prior to an exercise session using fitness device 32 and during such an exercise session.” Ex. 1012, 2:48-53. As such, when a live fitness expert (“*trainer*”) at the web site uploads video and/or audio for the real time two way communication (“*signal from the trainer*”), the web site sends a video and audio signal to the user.

522. To the extent “consisting of” is a so-called “closed group,” Clem renders this limitation obvious. It would have been obvious to a POSITA to select a second signal containing only a packetized control signal and a signal from a trainer, the signal from the trainer comprising a signal selected from the group consisting of an audio signal and a visual signal. Control signals and signals from a trainer were one of only a finite number of choices for a POSITA and would have been obvious to try.

523. Therefore, Clem renders obvious “*the packetized second signal comprises a packetized control signal and a signal from a trainer, the signal from the trainer comprising a signal selected from the group consisting of an audio signal and a visual signal.*”

15. Claim 28

[28] An exercise device as recited in claim 27, wherein receipt of said packetized second signal is substantially uninterrupted during receipt of said control signal.

524. Clem renders obvious “*wherein receipt of said packetized second signal is substantially uninterrupted during receipt of said control signal.*”

525. Clem describes signals that are being sent as part of a “real time” communication and to control the motors of the treadmill. Ex. 1012, 2:53-3:7. I further describe the packetized second signal and control signal in my discussion of Claim 27 above.

526. While Clem does not explicitly disclose that the receipt of packetized second signal is substantially uninterrupted during receipt of a control signal, a POSITA would have understood that the receipt of the second signal is substantially uninterrupted. Clem describes that the two way communication occurs in **real time**, which requires that the signals are uninterrupted, as otherwise the signal would be delayed or stuttered. Ex. 1012, 2:53-57.

527. Further, such an uninterrupted signal was within the knowledge of a POSITA, as shown by the disclosures in Studor as I previously stated. Ground 1 Claim 28.

528. A POSITA would have been motivated to include the uninterrupted signal because it would ensure that the user could receive uninterrupted communications from the trainer thus providing a better user experience. Further, it would allow the trainer to simultaneously control the incline or speed of the treadmill while providing instructions to the user. *See* Rutberg Decl. ¶¶ 78-83, 126.

Likewise, the trainer could provide targeted instruction regarding the exercise routine by being able to simultaneously and without interruption instruct the user while changing the speed or incline of the treadmill. *See* Rutberg Decl. ¶¶ 78-83, 126.

529. Therefore, Clem renders obvious “*receipt of said packetized second signal is substantially uninterrupted during receipt of said control signal.*”

16. Claim 36

[36.1] An exercise device as recited in claim 29, further comprising a control panel, the control panel being configured to enable a user to input the first signal and to receive the second signal.

530. Clem discloses a console (“*control panel*”) which includes a “user input” that enables the user to input the first signal. As shown in Fig. 3 below (and as I discussed previously), a POSITA would have understood the user input is input at the console and then communicated through the internet to the web site. Ground 2 Limitations [1.2]/[29.2].

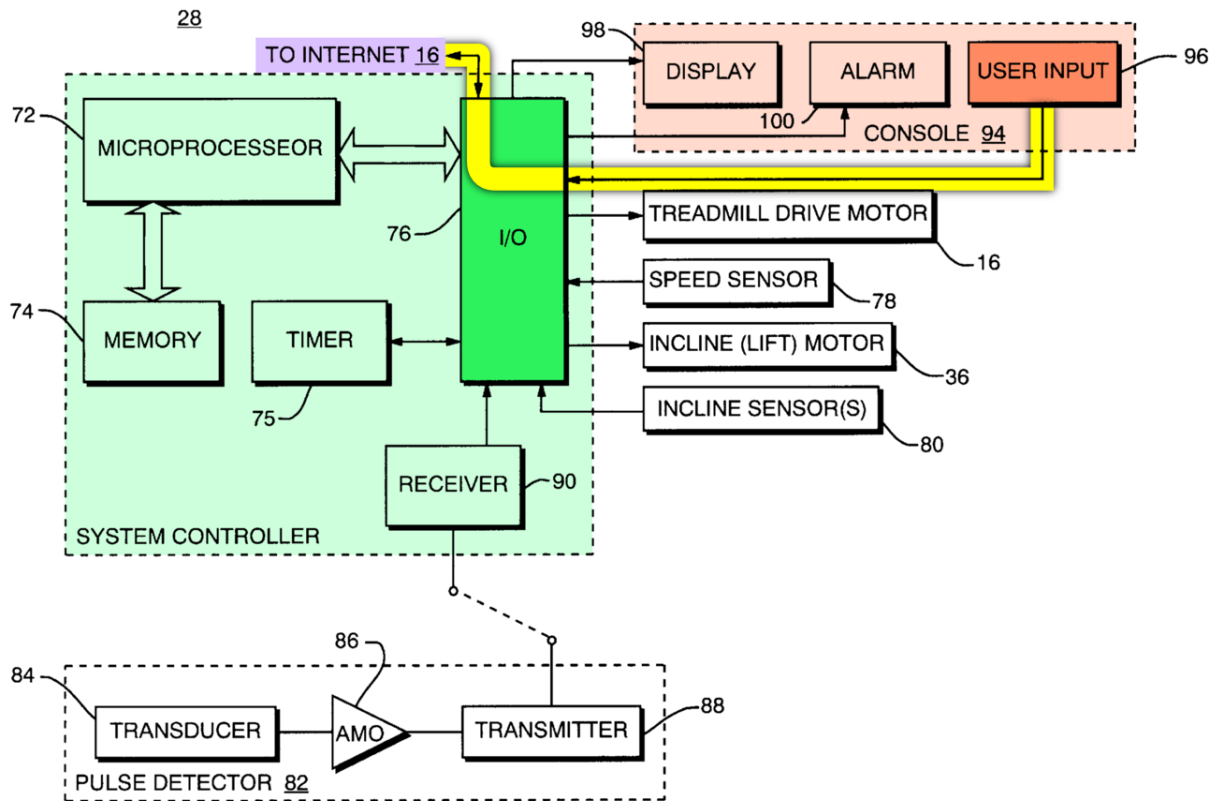


FIG. 3

Ex. 1012, Fig. 3 (annotated)

531. A POSITA would also have understood the console also receives the second signal, which can be displayed on the display. Figure 3 below shows how the signal (in yellow) is conveyed from the controller (in green) to the display on the console. Similarly, Clem describes real time two way communication, wherein a user inputs “video and audio information” (which a POSITA would understand occurs at the console) (“*first signal*”) and then can receive signals (including audio and/or video information) (part of “*second signal*”) at the display in the console from the live fitness expert located at the web site through the communicating

mechanism (which includes the microprocessor). I further incorporate my discussions above regarding the signals sent to and from the console.

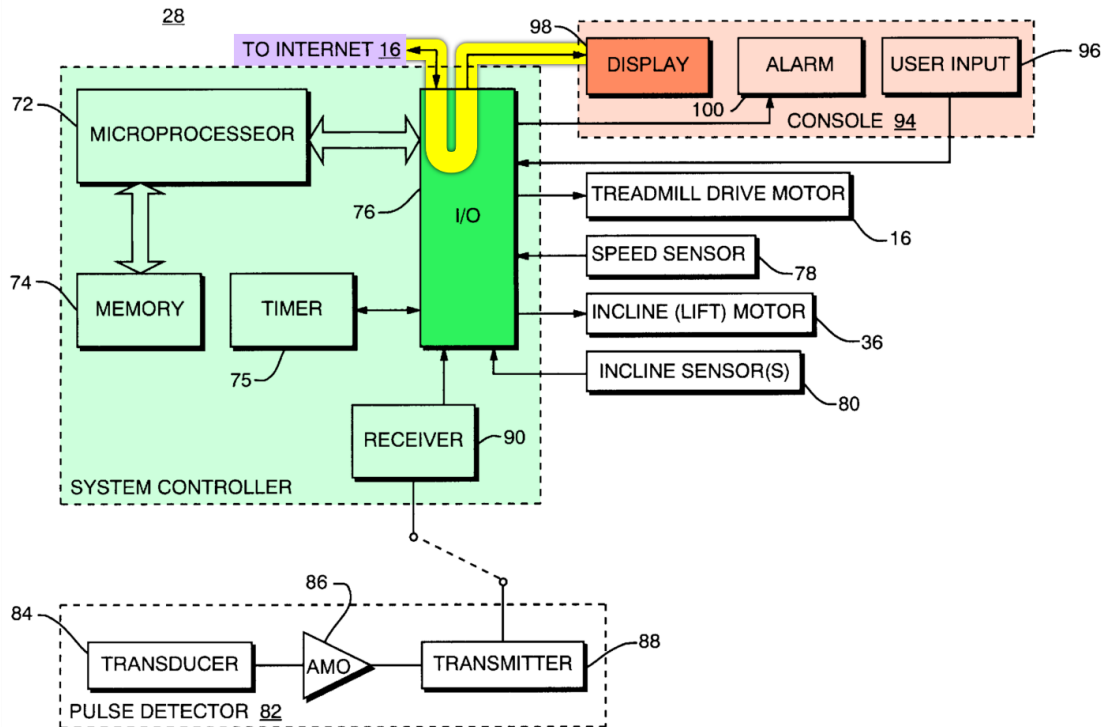


FIG. 3

Ex. 1012, Fig. 3 (annotated)

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment. For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, a user of the fitness system 10 at the user location 34 can interactively

obtain the control information from a computer located at the web site 12. The communication can include the uploading and downloading of video and audio information.

Ex. 1012, 2:53-65.

The output signals of the microprocessor 72 also control the display 98 which can be located on a console 94 of the exercise equipment 32. It will be understood that information representative of the operation of any of the devices included in the controller 28 can be interactively transmitted between the user location 34 and the web site 12 by way of I/O circuitry 76 which is coupled to the internet system 19 by way of interface 22.

Ex. 1012, 5:15-22.

532. As such, Clem renders obvious this limitation.

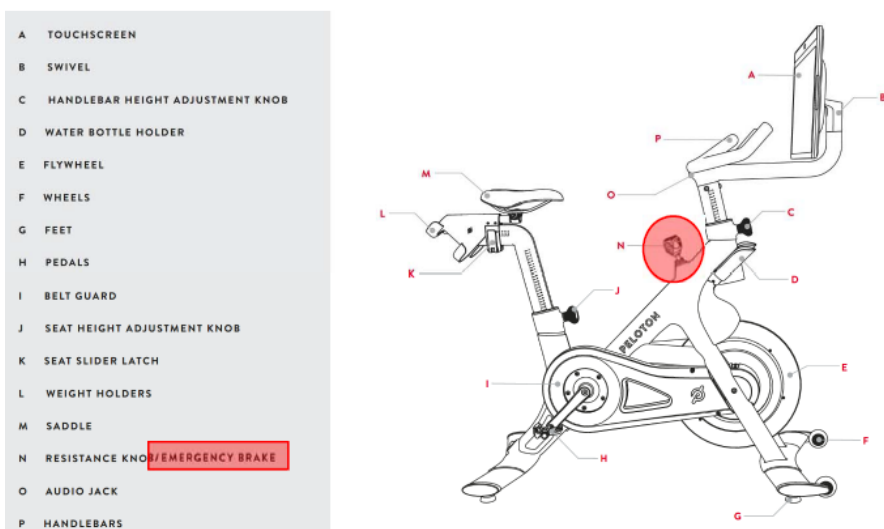
17. Claim 38

[38.1] An exercise device as recited in claim 29, wherein the exercise device further comprises a safety mechanism, said safety mechanism capable of manipulating the operating parameters of the exercise mechanism in the event that the packetized second control signal is interrupted.

533. For purposes of this IPR, I have been asked to construe this limitation based on how iFIT has apparently construed it in the district court litigation. I have been informed that in the district court, iFIT has stated that an emergency brake “is capable of manipulating the operating parameters by immediately stopping the flywheel upon activation of the emergency brake” and that iFIT has taken the

position that the emergency brake is capable of immediately stopping the flywheel in the event the packetized second control signal is interrupted, as shown below.

The Bike+ further comprises a safety mechanism in the form of, for example, an emergency brake.



Peloton Bike+ Manual, p. 10–11 (PELOTON_ICON2_007903)

The emergency brake is capable of manipulating the operating parameters by immediately stopping the flywheel upon activation of the emergency brake.

The resistance knob can be used as an emergency brake. To stop immediately, push down on the resistance knob.

This bike has a direct driven flywheel. If the flywheel is moving, the pedals are moving. Removing your feet from the pedals while they are moving can cause serious injury. Stop by reducing pedaling frequency in a controlled manner or by using the emergency brake. Do not remove your feet from the pedals until the flywheel stops moving.

Peloton Bike+ Manual, p. 4 (PELTON_ICON2_007900)

- **Emergency brake:** Press down on the resistance knob while pedaling slowly. The flywheel should come to a complete stop immediately. If it does not, stop using the bike immediately and contact Peloton Support.

Peloton Bike+ Manual, p. 40 (PELTON_ICON2_007918)

On information and belief, in the event the packetized second control signal (i.e., JSON information) is interrupted, the emergency brake is capable of immediately stopping the flywheel.

Ex. 1014, 30-31.

534. Under this construction, Clem renders obvious this limitation. Clem teaches a safety interface (“*safety mechanism*”) that detects “whether a user falls off or the user heart rate goes too high and shutting the treadmill off.”

A safety interface 20 is provided within user location 34 between controller 28 and network connection device 18 **for detecting whether a user falls off or the user heart rate goes too high and shutting the treadmill off.**

Ex. 1012, 3:27-32.

535. With any application that is connected to a network, a POSITA implementing Clem would have to determine how to implement the fitness system in the event the connection to the web site is interrupted. For example, in a navigation application, when the signal is interrupted, if part of the route was already downloaded the navigation could continue in case the signal is able to be restored. The navigation could continue on the same path for a set amount of time in case the signal is able to be restored. And the navigation can stop. The application would need to account for situations where the signal is being interrupted intermittently but can reconnect, and for situations where the signal is interrupted completely. In the former, a POSITA would want to give some window where the connection can be restored. Otherwise, if the navigation immediately stops and then starts every time a signal is interrupted in a location where there is a bad connection, this could lead to a bad user experience.

536. Here, a POSITA implementing Clem could do something very similar. If the exercise program is already downloaded, the program could continue or the resistance and speed could continue for a set amount of time to provide time for the signal to be restored. Optionally, if it appears that the network connection is interrupted indefinitely, the braking system could immediately stop the flywheel or other movable element. By accounting for both situations, a POSITA could provide the user with a better experience—the system does not automatically stop

or slow down, and then start again every time the connection is lost and then restored.

537. In addition, I understand from Mr. Rutberg that a POSITA would have been motivated to incorporate the safety interface to shut off the treadmill when the control signal is interrupted. Rutberg Decl. ¶¶ 131-133. He states that it can be dangerous to the user if the control signal is lost, particularly at a difficult part of the exercise program. Per Mr. Rutberg, the safest response is to automatically decrease the difficulty and shut down the treadmill. Rutberg Decl. ¶ 133.

538. Implementing the safety interface in Clem so that it stops or slows down in the event the packetized second control signal would have been obvious. A POSITA would have understood that if the signal is interrupted, the treadmill should not continue at the same speed indefinitely. For example, if the signal is interrupted at a particular difficult or intense level, this could be dangerous for the user. Rutberg Decl. ¶¶ 96-101, 133. A POSITA implementing Clem would have been motivated to implement the safety interface to shut the treadmill off in the same way it does when it detects whether the user has fallen off or the user's heart rate is too high. Ex. 1012, 3:27-32.

539. Thus, Clem renders obvious *“a safety mechanism, said safety mechanism capable of manipulating the operating parameters of the exercise*

mechanism in the event that the packetized second control signal is interrupted” as recited in the claim under iFIT’s construction.

18. Claim 40

[40.1] *An exercise device as recited in claim 29, wherein the exercise device further comprises one or more sensors, said one or more sensors being configured to sense the one or more operating parameters of the exercise mechanism.*

540. Clem discloses the exercise device with speed and/or incline sensors (“sensors”) (highlighted in pink) that sense the speed or incline (“operating parameters”) of the treadmill (“exercise mechanism”):

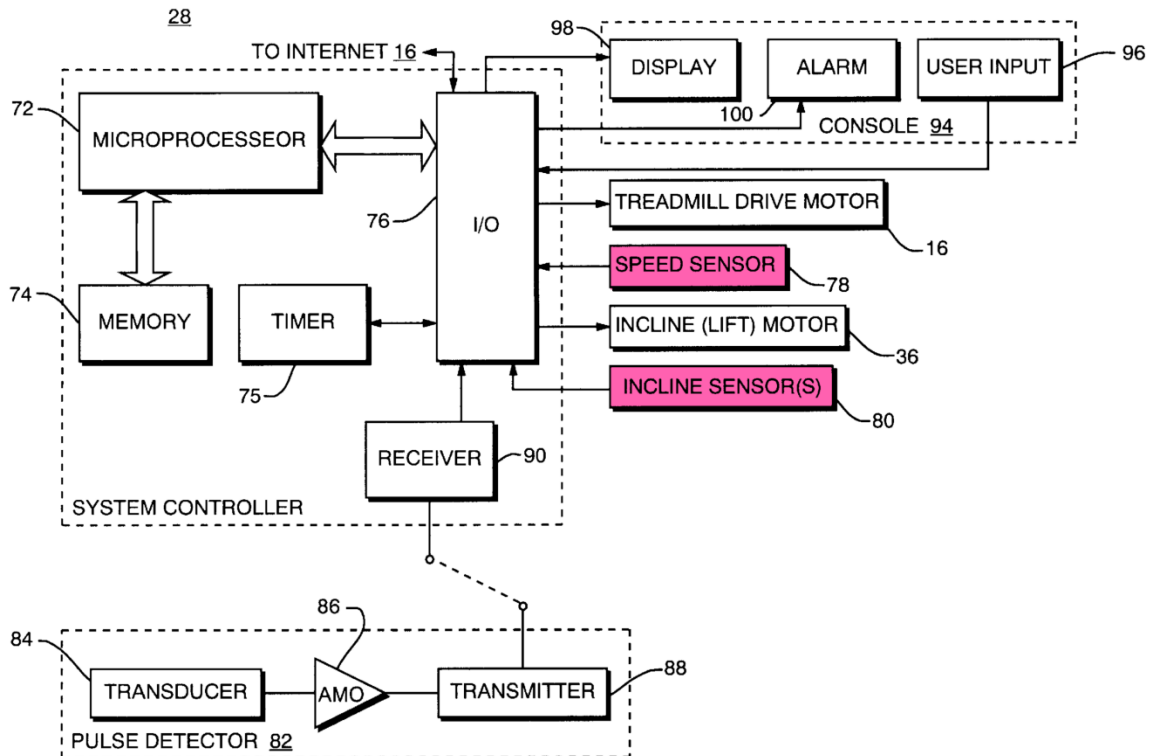


FIG. 3

Ex. 1012, Fig. 3 (annotated)

541. The fitness device in Clem preferably “includes a speed sensor for detecting the actual speed of the fitness device 32 and an incline sensor or determining the actual grade.” Ex. 1012, 5:24-30.

542. Clem explains that such sensors were well-known at the relevant time:

Since the speed and grade of the fitness device 32 is determined by the controller 28, the controller 28 normally has all speed and grade information required to the fitness control device 32. However, it is preferable to include **a speed sensor for detecting the actual speed of the fitness device 32 and an incline sensor for determining the actual grade. Sensors suitable for this purpose are well known to 30 those skilled in the art.** For example, a speed sensor 78 can be a conventional Hall effect type sensor adapted to provide a value to the controller 28 that indicates the revolutions per minute of the drive roller 21. The controller 28 can then convert the value received from speed sensor 78 to miles per 35 hour. The incline sensor 80 can be any conventional sensor suitable for the purpose.

Ex. 1012, 5:24-37.

543. Thus, Clem discloses “*one or more sensors, said one or more sensors being configured to sense the one or more operating parameters of the exercise mechanism*” as recited in the claim.

19. Claim 45

[45.1] An exercise device as recited in claim 29, wherein the exercise device further comprise a diagnostic control, said diagnostic control activating a

connection with a communication system to check the status of the exercise device.

544. Clem in view of Hickman renders obvious this limitation. Clem teaches a communication system between the treadmill and a remote web site (as discussed previously as to Limitations [1.3]/[29.3]). The interactive coupling between the fitness device and web site permits the web site and fitness device to transmit information between each other.

Referring now to FIG. 1, there is shown a schematic representation of the interactive programmable fitness system 10 of the present invention. The fitness system **10 includes a programmable fitness device 32 interactively coupled with a web site 12.** The fitness device 32 is disposed at a user location 34 at a location that is geographically remote from the web site 12. The interactive coupling between the fitness device 32 and the web site 12 can be by way of an internet system 19. **The interactive coupling permits the fitness device 32 to transmit various kinds of user location information to the web site 12. It also permits the web site 12 to transmit control information to the user location 34 to control, for example, drive motor 16 and incline motor 36 of exercise device 32.** Thus the web site 12 can operate as a server device for the user. Information can be transmitted between the fitness device 32 and the web site 12 at any time, including immediately prior to an exercise session using fitness device 32 and during such an exercise session.

Ex. 1012, at 2:34-52.

545. Although Clem does not expressly teach activating a connection with the communication system to check the status of the exercise device, this is taught by Hickman. Like Clem, Hickman teaches a similar connection between the stationary bicycle and a remote system computer. Hickman teaches a “batch system connection [that] can be used to update the software on a number of computers 24 of local system 12, or to upload exercise session data from a number of local systems 12 on a regular basis, *e.g.* daily, weekly, monthly, etc.”:

In FIG. 8, a process 166 running on a remote system computer 66 is illustrated. The process 166 begins at 168 and, in a step 170, an activity type is determined. A first type of activity is a **batch system connection whereby the remote system computer 66 sequentially connects with a series of local systems for the uploading or downloading of information.** This process is accomplished in step 172. **A batch system connection can be used to update the software on a number of computers 24 of local system 12,** or to upload exercise session data from a number of local systems 12 on a regular basis, *e.g.* daily, weekly, monthly, etc.

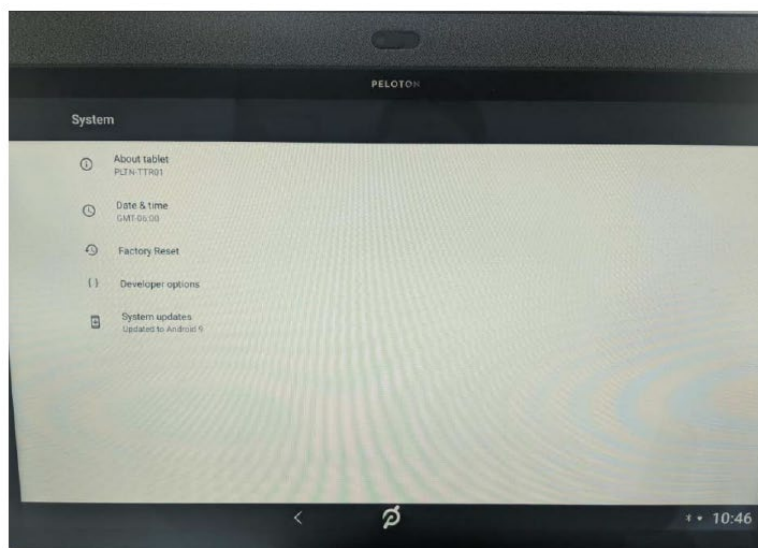
Ex. 1013, 10:46-56.

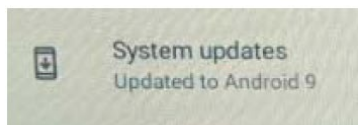
546. Hickman also describes running diagnostics and uploading “information used for diagnosing or improving the operation of the local system” and then that “information can be downloaded to the local system 12 from the

remote system computer to ... provide upgrades for the software running on the local system computer 24.” Ex. 1013, 10:38-56.

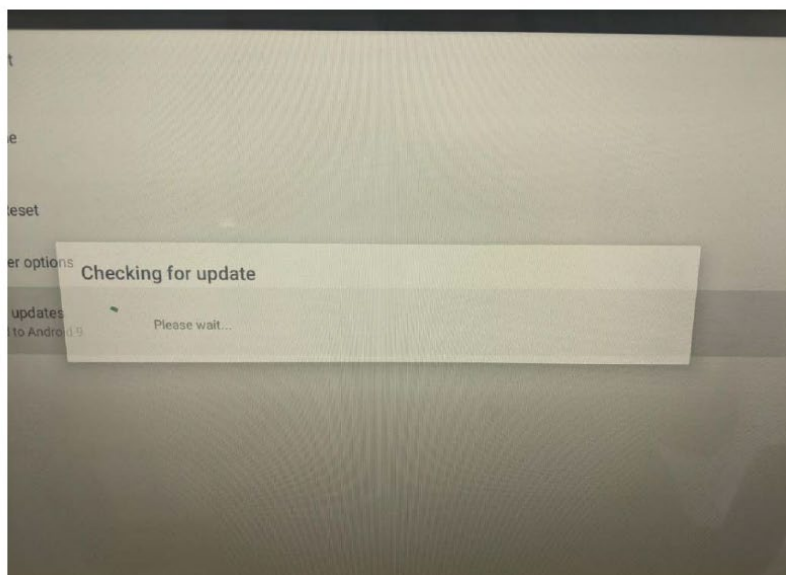
547. I understand that diagnosing and improving a local system using software updates is consistent with how iFIT has construed “diagnostic control” in the district court litigation. I have been informed that in the district court, iFIT has stated a system updates button on the touchscreen that, when pressed, activated a connection with the remote serve to check the status of the exercise device.

The Bike+ comprises a diagnostic control, for example, in the form of the system updates button on the touchscreen.





Upon pressing the system updates button, a connection is activated with the remote server (i.e., communication system) to check the status of the exercise device.



Ex. 1014, 32-33.

548. Likewise, the Clem in view of Hickman renders obvious a process for diagnosing software updates from a remote location.

549. A POSITA would have been motivated to improve the fitness device of Clem to include a diagnostic control because it would ensure the latest software is being used. A POSITA would understand that software used by Clem to enable the two-way communication discussed in Clem would need to be updated periodically to ensure optimal operation. For example, new fitness programs could require more advanced software as technology continued to improve. Further,

software updates are often important to fix bugs that are not identified until robust use of the software. Software updates are also used to introduce new features and expanded capabilities. It would also have been obvious to a POSITA to check the currently installed version against the most recent version, so that the new version of software is not downloaded and installed when it is the same as what is currently installed.

550. A diagnostic control was well-known by the relevant time period. For example, U.S. Patent 5,845,077 (“Fawcett”) described an update service (“*diagnostic control*”) that automatically inventoried the user computer “to determine what computer software may be out-of-date, and/or need maintenance updates.”

Creators of computer software provide the most up-to-date versions of their computer software on an update service. A user who has purchased computer software calls the update service on a periodic basis. **The update service automatically inventories the user computer to determine what computer software may be out-of-date, and/or need maintenance updates.** If so desired by the user, the **update service computer automatically downloads and installs computer software to the user computer.** By making periodic calls to the update service, the user always has the most up-to-date computer software immediately available. The update service may also alert the user to new products (*i.e.* including new help files, etc.),

and new and enhanced versions of existing products which can be purchased electronically by a user from the update service.

Ex. 1020, Abstract.

551. By way of another example, U.S. Patent. No. 6,151,643 (“Cheng”) likewise taught an application (“*diagnostic control*”) that “first determine[s] the products that are installed in the client computer” and then determines “whether there is an update available for a more recent version of the software product than that installed on the client computer.”

On each user computer, or synonymously client computer, operating in accordance with one embodiment of the invention there is provided a **client application that periodically connects over the network to the update database of the service provider computer system**. The client application automatically downloads a portion of the database to the client computer, preferably to update a mirror of portions of database. **From client database, the client application determines which software updates are applicable or relevant to the user’s computer. This is preferably done by first determining the products that are installed in the client computer, and determining for each of these whether there is an update available for a more recent version of the software product than that installed on the client computer. The applicable software updates are identified to the user.**

The user selects various software updates for installing on the client computer. **Either the client application** or the service provider

computer **then uses the network location specified in the database to connect to the computer system of the software vendor and download the software update from there to the client computer.**

Ex. 1021, 3:25-45.

552. Further, at the relevant time, checking the availability of software updates through a network connection was a well-known option in the art. *See, e.g.,* Ex. 1020, 1:38-52 (software updates allow for fixing defects). Notably, checking the availability of software updates through a network connection could allow for automatic updates. Notably, updating software through a network connection was more desirable than using media such as a CD or DVD to update the software. Forcing a user to obtain physical media for updates creates more friction and made it less likely that user would update the software. In addition, such a system limits the need for physical storage media to be delivered. Further, it is likely that the user would only look for updates if there was an existing problem with the software. Providing the status of the software through a network connection requires little work on the part of the user.

553. Thus, Clem in view of Hickman renders obvious “*the exercise device further comprise a diagnostic control, said diagnostic control activating a connection with a communication system to check the status of the exercise device*” as recited in the claim.

20. Claim 46

[46.1] An exercise device as recited in claim 45, wherein the diagnostic control activates a downloading process to retrieve one or more software updates the from communication system.

554. Clem in view of Hickman renders obvious this limitation. As discussed with respect to Claim 45, Clem teaches a communication system between the treadmill and a remote web site (as discussed previously as to Limitations [1.3]/[29.3]). The interactive coupling between the fitness device and web site permits the web site and fitness device to transmit information between each other.

Referring now to FIG. 1, there is shown a schematic representation of the interactive programmable fitness system 10 of the present invention. The fitness system **10 includes a programmable fitness device 32 interactively coupled with a web site 12.** The fitness device 32 is disposed at a user location 34 at a location that is geographically remote from the web site 12. The interactive coupling between the fitness device 32 and the web site 12 can be by way of an internet system 19. **The interactive coupling permits the fitness device 32 to transmit various kinds of user location information to the web site 12. It also permits the web site 12 to transmit control information to the user location 34 to control, for example, drive motor 16 and incline motor 36 of exercise device 32.** Thus the web site 12 can operate as a server device for the user. Information can be transmitted between the fitness device 32 and the

web site 12 at any time, including immediately prior to an exercise session using fitness device 32 and during such an exercise session.

Ex. 1012, at 2:34-52.

555. Although Clem does not expressly teach activating a download process to retrieve one or more software updates, this is taught by Hickman. Like Clem, Hickman teaches a similar connection between the stationary bicycle and a remote system computer. Hickman teaches a “batch system connection [that] can be used to update the software on a number of computers 24 of local system 12, or to upload exercise session data from a number of local systems 12 on a regular basis, *e.g.* daily, weekly, monthly, etc.”:

In FIG. 8, a process 166 running on a remote system computer 66 is illustrated. The process 166 begins at 168 and, in a step 170, an activity type is determined. A first type of activity is a **batch system connection whereby the remote system computer 66 sequentially connects with a series of local systems for the uploading or downloading of information**. This process is accomplished in step 172. **A batch system connection can be used to update the software on a number of computers 24 of local system 12**, or to upload exercise session data from a number of local systems 12 on a regular basis, *e.g.* daily, weekly, monthly, etc.

Ex. 1013, 10:46-56.

556. Hickman also describes running diagnostics and uploading “information used for diagnosing or improving the operation of the local system” and then that “information can be downloaded to the local system 12 from the remote system computer to ... provide upgrades for the software running on the local system computer 24.” Ex. 1013, 10:38-56.

557. I understand that diagnosing and improving a local system by downloading software updates is consistent with how iFIT has construed “diagnostic control” in the district court litigation. I have been informed that in the district court, iFIT has stated that upon pressing the system updates button, the downloading process to retrieve one or more system updates from the communication system is activated.

Step 3: Tap on 'System updates'.

This will tell you whether or not you have the latest available version of software on your device.

If you do not, you will be able to begin the update process in the pop-up window that displays on your screen.

<https://support.onepeloton.com/hc/en-us/articles/4402287359380-How-Do-I-Verify-That-I-Have-The-Latest-System-Updates->

Ex. 1014, 33-34.

558. Likewise, the Clem in view of Hickman renders obvious a process for diagnosing and then downloading software updates from a remote location.

559. A POSITA would have been motivated to improve the fitness device of Clem to include a diagnostic control because it would ensure the latest software

is being used. A POSITA would understand that software used by Clem to enable the two-way communication discussed in Clem would need to be updated periodically to ensure optimal operation. For example, new fitness programs could require more advanced software as technology continued to improve. Further, software updates are often important to fix bugs that are not identified until robust use of the software. Software updates are also used to introduce new features and expanded capabilities. It would also have been obvious to a POSITA to check the currently installed version against the most recent version, so that the new version of software is not downloaded and installed when it is the same as what is currently installed.

560. A diagnostic control was well-known by the relevant time period. For example, U.S. Patent No. 5,845,077 (“Fawcett”) described an update service (“*diagnostic control*”) that automatically inventoried the user computer “to determine what computer software may be out-of-date, and/or need maintenance updates.” And if the software was out-of-date, the service “automatically downloads and installs computer software to the user computer.”:

Creators of computer software provide the most up-to-date versions of their computer software on an update service. A user who has purchased computer software calls the update service on a periodic basis. The update service automatically inventories the user computer to determine what computer software may be out-of-date, and/or need

maintenance updates. If so desired by the user, the **update service computer automatically downloads and installs computer software to the user computer**. By making periodic calls to the update service, the user always has the most up-to-date computer software immediately available. The update service may also alert the user to new products (*i.e.* including new help files, etc.), and new and enhanced versions of existing products which can be purchased electronically by a user from the update service.

Ex. 1020, Abstract.

561. By way of another example, U.S. Patent. No. 6,151,643 (“Cheng”) likewise taught an application (“*diagnostic control*”) that “first determine[s] the products that are installed in the client computer” and then determines “whether there is an update available for a more recent version of the software product than that installed on the client computer.” Subsequently, the application “download[s] the software update from [the computer system of the software vendor] to the client computer.”

On each user computer, or synonymously client computer, operating in accordance with one embodiment of the invention there is provided a client application that periodically connects over the network to the update database of the service provider computer system. The client application automatically downloads a portion of the database to the client computer, preferably to update a mirror of portions of database. From client database, the client application determines which

software updates are applicable or relevant to the user's computer. This is preferably done by first determining the products that are installed in the client computer, and determining for each of these whether there is an update available for a more recent version of the software product than that installed on the client computer. The applicable software updates are identified to the user.

The user selects various software updates for installing on the client computer. **Either the client application** or the service provider computer **then uses the network location specified in the database to connect to the computer system of the software vendor and download the software update from there to the client computer.**

Ex. 1021, 3:25-45.

562. It was well within the knowledge of a POSITA that a diagnostic control that activated a downloading process from a communication system had several advantages, including reducing user related installation problems, avoiding the need for storage media, and ensuring that if the software gets corrupted, the user can get a new up-to-date copy of the software.

The update service has several advantages. A user is automatically provided with information about the available versions of computer software as result of the inventory conducted by the update center computer. If the version of the computer software on the user computer has defects that are known and have been corrected, the user is alerted to this fact and is offered an up-to-date version of the computer software. The user is also alerted to the availability of new computer software, or enhanced versions of existing

computer software, and can purchase them electronically. **In either case, the most up-to-date versions of computer software are available for downloading to users.**

The available versions of the computer software can also be automatically installed on the user computer. **Since it is no longer necessary for the user to install the computer software, the incidence of user related installation problems is greatly reduced. It is also not necessary for the user to obtain or save any storage media since the computer software is downloaded directly to the user computer. If the computer software installed on the user computer ever gets corrupted, the user can call the update service (e.g. for some limited number of iterations) and download a new (and up-to-date) copy of the computer software.**

Ex. 1020, 3:3-24.

563. Thus, Clem in view of Hickman renders obvious “*the diagnostic control activates a downloading process to retrieve one or more software updates the from communication system*” as recited in the claim.

J. Independent Claim 49

[49.0] An exercise device configured to enable a user to receive workout-related information, comprising:

564. Clem teaches an exercise device. See Ground 2 Limitations [1.0]/[29.0].

565. Clem teaches that the exercise device is configured to enable a user to receive workout-related information, such as “video and audio information” from

“a real time two way communication” between a live fitness expert located at a web site and the user. *See* Ex. 1012, 2: 53-65.

[49.1] an exercise mechanism comprising a movable element for movement in performance of exercise by a user;

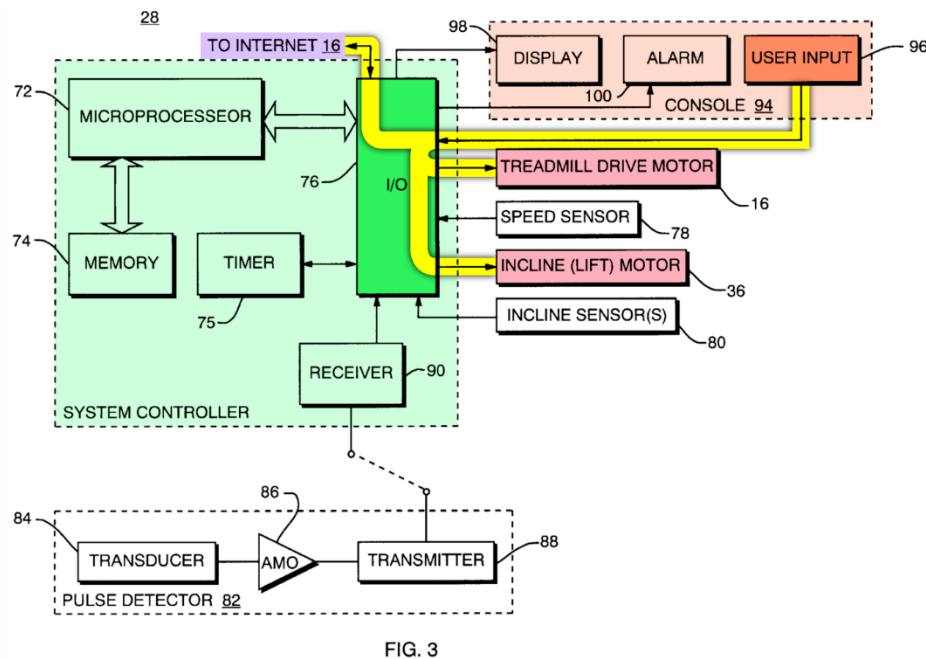
566. Clem discloses “*an exercise mechanism comprising a moveable element for movement in performance of exercise by a user.*” *See* Ground 2 Limitations [1.1]/[29.1].

[49.2] a user interface device communicating with the exercise mechanism and configured to gather one or more user control signals from the user;

567. Clem renders obvious a user interface device communicating with the exercise mechanism. *See* Claim Limitations [1.2]/[29.2].

568. The user can “download new fitness equipment programs for controlling the exercise equipment,” which a POSITA would understand requires the user select the program (*i.e.* input a selection or enter “commands”), which then controls which program gets downloaded. Ex. 1012, Abstract, 2:15-17, cl. 23. This control program indirectly controls the motors, as the selected program is executed by the controller, which then sends control signals to the motor to control the motor. Ex. 1012, 3:1-7. And as shown in the Fig. 3 below, the signals (signals in yellow) gathered from the “user input” on the console (in orange) can be sent through the controller (in green) over the internet (in purple) to select a program that is downloaded to the treadmill and then executed by the controller to change

the incline and/or speed of the treadmill by sending a control signal to the motors (pink). Ground 2 Limitations [1.3]/[29.3].



Ex. 1012, Fig. 3 (annotated)

569. To the extent Clem does not explicitly show the user input controls the device, a POSITA would have understood that the signals gathered from the user at the “user input” control the motors by being used by the web site to select a control program stored at the web site that in turn, when downloaded and executed by the treadmill’s controller, controls the motors. Further, a POSITA would have understood that the user input in Clem would alter the speed, incline and suspension of the treadmill and that the “commands related to the database” would be communicated at the user input, since that is the only place where “user input” is discussed. Indeed, user interfaces on treadmills commonly included

locations to input signals to select program and control speed and/or incline of the treadmill. Clem itself recognized that user could “manually adjust the resistance level according to the display in order to adjust the heart rate as needed.” Ex. 1012, 1:27-29. Further, the prior art recognized that it was well known that treadmills include controls for the user to input information to control the speed and/or incline of the treadmill, whether directly or via a program.

Exercise machines such as treadmills and stationary exercise cycles are widely available and **include a variety of features and operational controls. For example, typical treadmills include controls to vary the speed of the tread as well as some type of structure to vary the angle of inclination of the treadmill surface.**

Adjustments to the angle of inclination are made from time to time in order to regulate what may be viewed as the resistance or the degree of difficulty or hardness of the exercise being performed by the user on the treadmill.

Ex. 1022, 1:11-20.

For example, **motorized treadmills typically have a speed control by which the user may vary the speed of the belt of the treadmill between stop and a maximum speed.** The user in turn will need to vary the effort expended or the difficulty between the slow speed and the fast speed.

Ex. 1006, 1:29-35.

570. For example, Watterson describes “input means 17” on the chassis of a treadmill console that include buttons 18 and 20 that allow the user to increase or decrease the speed or incline of the treadmill. In addition, there is also a button to select “between the various programs” (labeled 104).

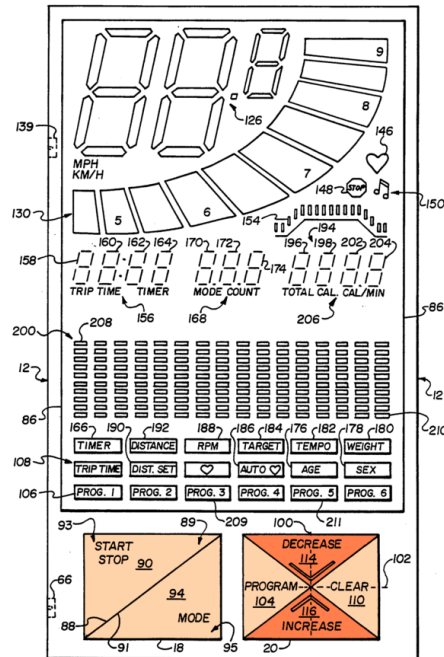


Fig. 2

Ex. 1022, Fig. 2 (annotated)

The console 10 has input means 17 which, in the illustrated embodiment of FIGS. 1 and 2 includes input buttons 18 and 20 (FIG. 2) and an encoder 22 in FIG. 1. The input means 17 is operable by the user to supply selected input data signals to the console 10.

Ex. 1022, 3:63-66.

The left quadrant 104 of switch 20 is operated to select between the various programs as shown by an array of bar indicators 108 in the lower portion of the LCD array 86.

Ex. 1022, 5:41-44.

Various functions (speed, time, heart rate) are selected with the mode switch 94 and using the increase 116 and decrease switches 114 to set the various parameters.

Ex. 1022, 8:11-15.

571. Similarly, in Brewer, the chassis on the console of the treadmill is configured to receive user input to control the speed or incline of the treadmill.

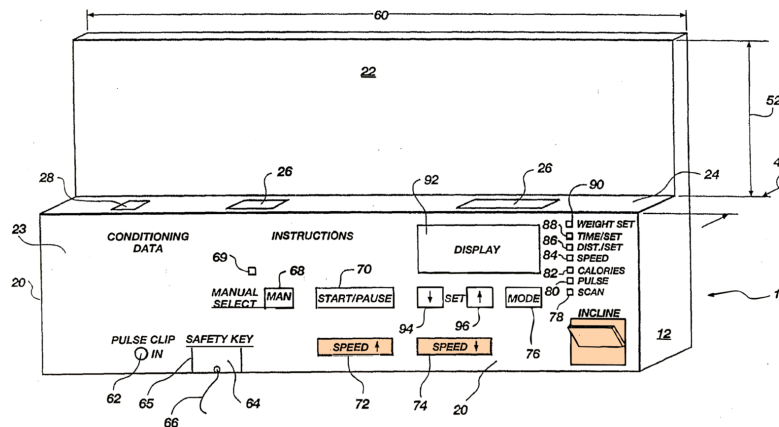


Fig. 1

Ex. 1006, Fig. 1 (annotated to show switches for incline and speed)

A control console for use with such an exercise machine has a chassis mountable to the frame. Input means are removably connectable to the chassis and operable to generate and supply a plurality of input signals reflective of a plurality of adjustments to the adjustment means to adjust or regulate the movement. Each

of the plurality of adjustments extends for a specific time or time segment.

Ex. 1006, 2:37-43

The adjustment means includes speed adjustment means for adjusting the speed of the treadmill belt. Such speed adjustment means is a motor controller with a motor connected to drive the treadmill belt. The output signals in this configuration are speed signals connected to vary the speed of the treadmill motor and in turn the belt. The adjustment means may also include means for adjusting the incline of the treadmill relative to the support surface.

Ex. 1006, 3:56-65.

The chassis 12 also has associated with it a speed-up switch 72 and a speed-down switch 74. The speed-up 72 and speed-down 74 switches are operated by the user to increase or decrease the speed with the control console 10 in the manual mode (switch 68) when the associated exercise machine is a treadmill or other motorized device.

Ex. 1006, 7:65-8:8.

572. A POSITA would have been motivated to include such a user input to gather a control signal from a user so that the user could control the device while operating it, selecting a control program as the user desired.

573. Therefore, Clem renders obvious “a user interface device communicating with the exercise mechanism and configured to gather one or more user control signals from the user” as recited in the claim.

[49.3] a communicating mechanism in communication with the user interface device and adapted to enable transmission of the user control signals to a remote communication system, the communicating mechanism being further adapted to receive a packetized second signal including synchronized control signals from the remote communication system;

574. **First**, Clem renders obvious “a communicating mechanism in communication with the user interface device and adapted to enable transmission of the user control signals to a remote communication system, the communicating mechanism being further adapted to receive a packetized second signal including synchronized control signals from the remote communication system.” See Ground 2 Limitations [1.3]/[29.3].

575. As previously discussed, Clem teaches a network connection device, fitness equipment interface, and the controller (together, the “communicating mechanism”) that communicates with the interactive interface on the console (“user interface device”) and is adapted to enable transmission of the user control signals to the web site (“remote communication system”). As I discussed, a POSITA would have understood that the inputs “commands related to a database” with a “plurality of control programs.” In other words, the user selects a control program based on the commands inputted. See Ground 2 Limitations [1.2]/[29.2],

and [49.2]. Upon selection of the control program, the signal corresponding to the selection of the control program is transmitted to web site, where the web site selects a control program according to the current user selection. Ex. 1012, 3:7-14, Figs. 1, 3.

576. Thus Clem renders obvious “*a communicating mechanism in communication with the user interface device and adapted to enable transmission of the user control signals to a remote communication system.*”

577. **Second**, once the control program is selected at the web site, the network connection device, fitness equipment interface, and the controller (together, the “*communicating mechanism*”) receives the fitness control program from the web site, which is then executed by the controller to control the motors that control the incline and speed. Ex. 1012, 3:1-7, Figs. 1, 3. As discussed previously, these signals are sent over the internet and thus are packetized. *See* Ground 2 Limitations [1.3]/[29.3].

578. Clem in view of Hickman further renders obvious that the packetized second signal includes synchronized control signals from the remote communication system. *See* Ground 2 Claim [4].

579. Clem teaches that the “**user can also** (in addition to selecting a program) **interact with fitness experts on-line** (thus receiving visual and audio signals) and provide exercise information and **receive control information.**” Ex.

1012, 2:15-21. It also teaches that “**in addition to interacting** (with a live fitness expert),” “**control information**” (such as “control signals” for directly or indirectly controlling the motors) can be obtained from the web site. Ex. 1012, 2:53-3:7. As such, a POSITA would understand Clem teaches a packetized second signal that includes “synchronized control signals.”

580. To the extent it is not explicit that the control signals from the web site include synchronized control signals, a POSITA would have understood that the control signals from the web site for the fitness equipment control program include synchronized control signals.

581. Further, including synchronized control signals was within the knowledge of a POSITA.

582. A POSITA would have been motivated to implement a synchronized signal as part of the fitness control program in Clem because the various parts of a workout would need to be performed with timing prescribed by the exercise script, and thus are synchronized for events to occur at the proper time as prescribed by the exercise script, as opposed to have events delayed, compressed, or out of order. Thus, control signals are synchronized to the appropriate time as required by the workout routine.

583. Further Hickman teaches this limitation. As I described previously, Hickman teaches the user selecting a script (*i.e.* program) to perform, causing the

device to gather a signal from the user which adjusts which script is to be performed. Once the script is selected, the performance information can be uploaded to the remote system computer. The remote system computer “can download new exercise scripts or programs to the local system computer to implement” changes that the personal trainer wants to make based the personal trainer’s analysis of the data collected from the user. The local station then downloads the modified script from the remote computer, which can control the resistance of the bicycle based upon a script stored locally. The user then performs the exercise on the bicycle, which has settings that have been implemented based on the script.

The system further includes a remote system having a remote computer, and a transmission medium including a telephone line that couples the local system to the remote system for data communication between the local system and the remote system. **The remote system may receive local system data from the local system concerning the use of the exercise apparatus,** and **the local system may receive remote system data from the remote system concerning the operation of the exercise apparatus.** The local computer preferably **controls the operation of the exercise apparatus based upon a modifiable script stored in a read/write memory of the local computer, which can be updated by the remote system.**

Ex. 1013, Abstract (excerpt).

For example, the remote system computer can be associated with one hundred local systems (used by one or more individuals in, for example, their homes), and **can be used to upload information from the exercise and health equipment of a local system to be analyzed by the personal trainer at the remote computer.** The personal trainer can then call the individual user to provide additional instruction, encouragement, and cautions, and **the remote system computer can download new exercise scripts or programs to the local system computer to implement these changes.**

Ex. 1013, 2:36-45.

The stationary bicycle 18 includes a housing 34 which, as stated previously, preferably **houses the computer 24,** a crank 36 provided with a pair of pedals 38, a seat 40 supported by a seat stem 42, handle bar 34 supported by handle bar stem 46, legs 48, and feet 50. The various components of the stationary bicycle 18 are typically attached to a rigid frame that is internal to the housing 34.

Ex. 1013, 4:19-25.

The computer 24 is coupled to a variety of input/output (I/O) devices including **a brake 52, a sensor 54, a display 56, a heart rate monitor (HRM) 59, a loudspeaker 58, an interface 60, a modem 62, and a voice board 64.** In this fashion, **the computer 24 can control and monitor the various functions of the stationary bicycle 18.**

Ex. 1013, 4:39-45.

Next, in a selection step 110, the user decides whether he wants to select his own training program for that session or if he would like the system 12 to select the program. If the user selects the program, he creates a user “script” of what kind of exercise program he would like to perform that day. For example, if the user wishes to simply bicycle at a fixed resistance for thirty minutes, that can be entered in step 112. Alternatively, more complex “scripts” can indicate that he would like to bicycle with interval training for thirty minutes, and then do five repetitions on the weight trainer 20.

Ex. 1013, 7:38-48.

The script therefore provides a general framework of a desired exercise session which can be varied based upon human personal trainer input from remote system 14, user input at local station 12, and detected user performance at local station 12.

Ex. 1013, 8:10-14.

1. An exercise system comprising:

a local system physically located at a first location and including at least one exercise apparatus having an adjustable resistance and at least one associated local computer having read/write memory, said at least one local computer controlling and monitoring the operation and use, respectively, of said at least one exercise apparatus, wherein said local computer can automatically control the resistance of said exercise apparatus based upon a script stored in said read/write memory of said local computer.

Ex. 1013, excerpt of Claim 1.

584. Therefore, Clem in view of Hickman renders obvious “*a communicating mechanism in communication with the user interface device and adapted to enable transmission of the user control signals to a remote communication system, the communicating mechanism being further adapted to receive a packetized second signal including synchronized control signals from the remote communication system*” as recited in the claim.

[49.4] means for reproducing the second signal; and

585. Clem in view of Hickman renders obvious “means for reproducing the second signal.” See Ground 2 Claim [21].

[49.5] means, responsive to the synchronized control signals carried by the second signal, for controlling the operating parameters of the exercise mechanism

586. Clem renders obvious “*means, responsive to the synchronized control signals carried by the second signal, for controlling the operating parameters of the exercise mechanism.*”

587. Clem teaches that the controller responds to the fitness equipment control program (“*synchronized control signals carried by the second signal*”) to provide “control signals required for controlling the incline and drive motors. Ex. 1012, 2:44-47, 3:1-7.

588. Furthermore, Clem teaches that the control signals control the operating parameters of the exercise mechanism. *See* Ground 2 Limitations [1.4]/[29.4].

589. Thus, Clem renders obvious “*means, responsive to the synchronized control signals carried by the second signal, for controlling the operating parameters of the exercise mechanism*” as recited in the claim.

* * *

590. Given the above, Claim 49 is obvious over Clem in view of Hickman.

K. Claims Dependent on Claim 49

1. Claim 50

[50] An exercise device as recited in claim 49, wherein the user interface device comprises one or more manually activated controls configured to generate the user control signals

591. Clem renders obvious “*the user interface device comprises one or more manually active controls configured to generate the user control signals.*”

592. As discussed above regarding Limitations [1.2]/[29.2] (and incorporated here), Clem includes a console which allows for “user input” that operates as an “interactive interface ... wherein commands related to the database can be entered at the user location. Ex. 1012, Fig. 3, cl. 23.

593. Although Clem does not explicitly disclose that the interactive interface comprises a manually activated control configured to generate the user

control signal, a POSITA would have understood that the “user input” on the console would include a manually activated control to generate the user control signals. Clem describes the user entering “commands related to the database” and Fig. 3 shows that the user input generates a signal to control the treadmill motors. Ex. 1012, 3:46-47, Fig. 3.

594. Further, manual user inputs (such as buttons on a console) for selection of programs for execution that controlled the user speed or incline of a treadmill or selection of exercise program were well known prior to the '062 patent. For example, both Brewer and Watterson describe a treadmill with manual inputs on the console to generate the user control signals to change the incline and/or speed or select a program. *See* Ground 2 Limitation [49.2]. I have highlighted where those manual inputs are found below.

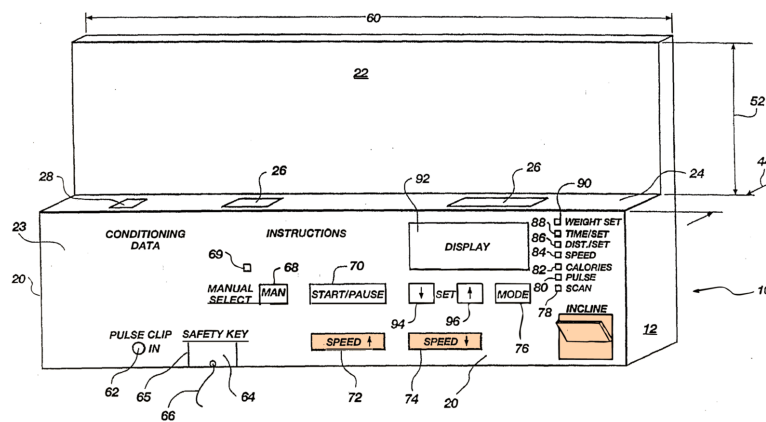


Fig. 1

Ex. 1006, Fig. 1 (annotated)

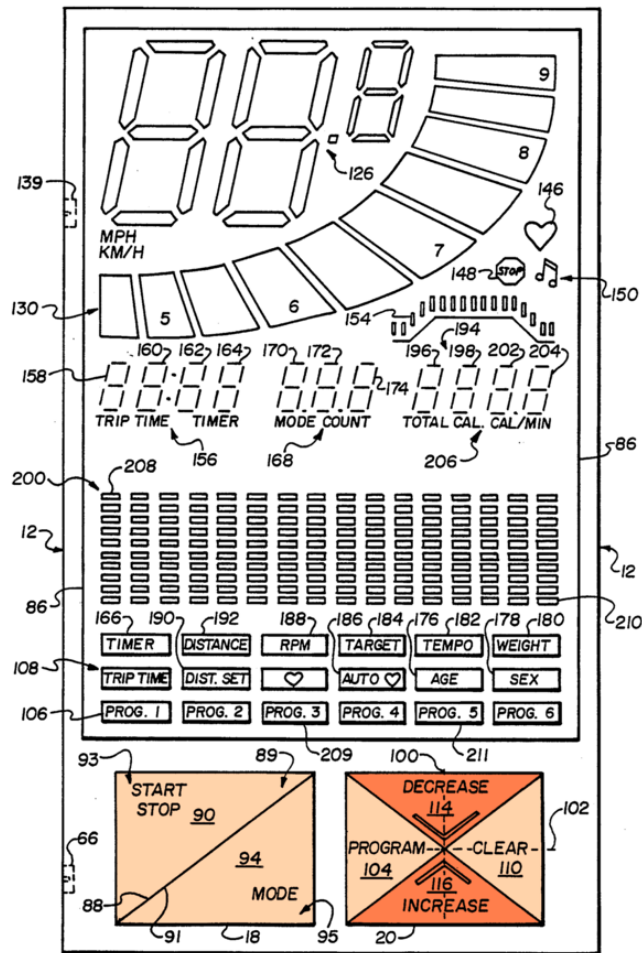


Fig. 2

Ex. 1022, Fig. 2 (annotated)

595. And for similar reasons as discussed regarding Ground 2 Limitation [49.2], a POSITA would have been motivated to incorporate those manual user inputs into Clem. Manual inputs were known, easy to use, and intuitive to users.

596. Therefore, Clem renders obvious “*the user interface device comprises one or more manually active controls configured to generate the user control signals*” as recited in the claim.

2. Claim 52

[52] An exercise device as recited in claim 49 wherein the second signal comprises one or more audio and video signals and the synchronized control signal.

597. Clem in view of Hickman renders obvious “*the second signal comprises one or more audio and video signals and the synchronized control signal.*” See Ground 2 Claim [4].

3. Claim 54

[54] An exercise device as recited in claim 49, wherein the communication system receives the one or more audio and video signals and the synchronized control signals from an exercise device of a trainer.

598. Clem in view of Hickman renders obvious “*the communication system receives the one or more audio and video signals and the synchronized control signals from an exercise device of a trainer.*”

599. As I discussed previously, a POSITA have understood that Clem view of Hickman renders obvious a control signal synchronized with at least one of an audio signal and visual signal. See Ground 2 Claim [4]. I note that a stored “trainer” would not have an exercise device and therefore would not be encompassed here.

600. Further, Clem teaches that a “user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 to engage in real time

two way communication.” Ex. 1012, 2:53-57. The web site can also send control signals for the motor. Ex. 1012, 2:60-3:7.

601. Clem does not expressly discuss the live fitness expert located the web site sending audio and video information and the control information through the internet (“*communication system*”) from an exercise device of the trainer at the web site. However a POSITA would have understood that they could have. As I already discussed, it was known how to include a camera and microphone into an exercise device as well as an input on the exercise device to control incline and/or resistance. *See* Ground 2 Claims [8]/[30], Limitation [49.2]. And since Clem expresses that the web site could provide the claimed signals, a POSITA would have been able to have the live fitness expert at the remote web site provide instructions from their exercise device.

602. As Mr. Rutberg testified, providing instructions from an exercise device is helpful to the exerciser, as the exerciser can see examples of how to perform the exercise, including for example, running form. Rutberg Decl. ¶¶ 88-92, 130. Likewise, Mr. Rutberg opines that a POSITA would have been motivated to send signals from the device of a trainer because it would allow the trainer to accompany the user in performing the exercise. Rutberg Decl. ¶¶ 88-92, 128-130.

603. Thus, Clem in view of Hickman renders obvious “*the communication system receives the one or more audio and video signals and the synchronized control signals from an exercise device of a trainer*” as recited in the claim.

4. Claim 56

[56] An exercise device as recited in claim 49, wherein the exercise device communicates with the communication system via a network.

604. Clem discloses “*the exercise device communicates with the communication system via a network.*”

605. As I discussed in Limitations [1.3]/[29.3], Clem teaches that the treadmill communicates with a remote web site through the internet. See Ground 2 Limitations [1.3]/[29.3], and [49.3]; Ex. 1012, Fig. 1, Abstract, 2:40-42, 5:17-22, Therefore, the treadmill communicates with the web site over the internet, which is a type of network.

606. Thus, Clem discloses “*the exercise device communicates with the communication system via a network,*” as recited in the claim.

5. Claim 57

[57] An exercise device as recited in claim 56, wherein the network comprises a network selected from the group consisting of a wide area network, a local area network, a home network, a packetized network, and the Internet.

607. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 52-53. I have been instructed by counsel to interpret “consisting of” the same way.

608. Clem renders obvious “*the network comprises a network selected from the group consisting of a wide area network, a local area network, a home network, a packetized network, and the Internet.*” As explained above with respect to Claim 56, Clem teaches that the “interactive coupling between the fitness device 32 and the web site 12 can be by way of an internet system 19.” Ex. 1012, 2:40-42; Ground 2 Claim [56].

609. To the extent “consisting of” is a so-called “closed group,” Clem renders this limitation obvious. It would have been obvious to a POSITA to select a network from the group of only a wide area network, a local area network, a home network, a packetized network, and the Internet. There were only a finite number of network types for a POSITA to choose from, wide area networks, a local area networks, home networks, packetized networks, and the Internet among them. A POSITA would have had good reason to try those network types and would have been a matter of design choice

610. Thus, Clem renders obvious *the network comprises a network selected from the group consisting of a wide area network, a local area network, a home network, a packetized network, and the Internet*, as recited in the claim.

6. Claim 59

[59] An exercise device as recited in claim 49, wherein the means for reproducing the second signal comprises one or more audio output devices and one or more video output devices.

611. Clem in view of Hickman renders obvious “*the means for reproducing the second signal comprises one or more audio output devices and one or more video output devices.*” See Ground 2 Claim [23].

7. Claim 61

[61] An exercise device as recited in claim 49, wherein the communication system analyses the user control signals and generates the packetized second signals based upon the analysis of the user control signals.

612. Clem in view of Hickman renders obvious “*the communication system analyses the user control signals and generates the packetized second signals based upon the analysis of the user control signals.*”

613. As I explained above with respect to Limitation [49.2], a POSITA would have understood that the user input in the console in Clem is configured to gather one or more user control signals from the user in that it receives input from the user to set up exercise sessions. These include signals from the user regarding the selection of a program to download.

Thus, the present invention is an interactive fitness system for permitting a user of a programmable exercise device to interact with a fitness server device while the user is in a location remote from the fitness server device. For example, the user can interact with the fitness server device from the home of the user. **Using the system of the present invention the user can download new fitness equipment programs for controlling the exercise equipment.**

Ex. 1012, Abstract (excerpt).

Thus, the present invention is an interactive fitness system for permitting a user of a programmable exercise device to interact with a fitness server device while the user is in a location remote from the fitness server device. For example, **the user can interact with the fitness server device from the home of the user. Using the system of the present invention the user can download new fitness equipment programs for controlling the exercise equipment.**

Ex. 1012, 2:14-17.

The exercise system of claim 1, wherein one of **a plurality of control programs is selected according to the user location information.**

Ex. 1012, cl. 17.

The exercise system of claim 1, further comprising **an interactive interface connected to the user location, wherein commands related to the database can be entered at the user location.**

Ex. 1012, cl. 23.

614. Once the remote system receives the signal as to the selected program, it generates the corresponding fitness equipment control programs which it sends to the controller which then sends control signals to the motors.

However, in a preferred embodiment of the fitness system 10 the **control information from the web site 12 can be a fitness equipment control program for execution by the controller 28.** In

this preferred embodiment the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12. Additionally, a digest of information for each user of fitness system 10 can be accumulated by the web site 12 and the control information can be determined according to the digest as well as the current user location information. For example, the web site can store a plurality of control programs and select a control program from the plurality according to the digest and the current user location information.

Ex. 1012, 3:1-15.

615. Clem’s disclosure is consistent with iFIT’s interpretation of this claim for purposes of infringement. iFIT contends that the server “analyzes the user control signals” by providing the “Target Metrics” in response to the user selecting a particular exercise class:

Claim 61	
An exercise device as recited in claim 49, wherein the communication system analyses the user control signals and generates the packetized second signals based upon the analysis of the user control signals.	On information and belief, the remote server (i.e., communication system) analyzes the user control signals that are generated in response to a user selecting an on-demand class. “Once a user selects an on-demand class and before the class starts, the Bike+ requests the class’s information including Target Metrics (i.e., including the time stamps and suggested ranges for speed and resistance) through an Application Programming Interface (API).” (Vivori Decl., ¶ 6) On information and belief, based off of this analysis of the user control signal, the remote server generates a packetized second signal.

Ex. 1014, 51 (annotated). That is akin to what Clem teaches. In particular, the user selects a program to download, the exercise device requests the program through the internet to the web site and then the web site, upon analyzing that signal, sends

the control program to the controller, where the controller provides the control signals required for controlling the motors. Ex. 1012, Abstract, 3:1-7.

616. Similarly, Hickman teaches a stationary bicycle which includes a local station with a computer that receives user input. The user selects a script (*i.e.* program) to perform, causing the device to gather a signal from the user which adjusts which script is to be performed. Once the script is selected, the performance information can be uploaded to the remote system computer. The remote system computer “can download new exercise scripts or programs to the local system computer to implement” changes that the personal trainer wants to make based the personal trainer’s analysis of the data collected from the user. The local station then downloads the modified script from the remote computer, which can control the resistance of the bicycle based upon a script stored locally.

The system further includes a remote system having a remote computer, and a transmission medium including a telephone line that couples the local system to the remote system for data communication between the local system and the remote system. **The remote system may receive local system data from the local system concerning the use of the exercise apparatus, and the local system may receive remote system data from the remote system concerning the operation of the exercise apparatus.** The local computer preferably **controls the operation of the exercise apparatus based upon a**

modifiable script stored in a read/write memory of the local computer, which can be updated by the remote system.

Ex. 1013, Abstract (excerpt).

For example, the remote system computer can be associated with one hundred local systems (used by one or more individuals in, for example, their homes), and **can be used to upload information from the exercise and health equipment of a local system to be analyzed by the personal trainer at the remote computer.** The personal trainer can then call the individual user to provide additional instruction, encouragement, and cautions, and **the remote system computer can download new exercise scripts or programs to the local system computer to implement these changes.**

Ex. 1013, 2:36-45.

The stationary bicycle 18 includes a housing 34 which, as stated previously, preferably **houses the computer 24,** a crank 36 provided with a pair of pedals 38, a seat 40 supported by a seat stem 42, handle bar 34 supported by handle bar stem 46, legs 48, and feet 50. The various components of the stationary bicycle 18 are typically attached to a rigid frame that is internal to the housing 34.

Ex. 1013, 4:19-25.

The computer 24 is coupled to a variety of input/output (I/O) devices including **a brake 52, a sensor 54, a display 56, a heart rate monitor (HRM) 59, a loudspeaker 58, an interface 60, a modem 62, and a voice board 64.** In this fashion, **the computer 24 can**

control and monitor the various functions of the stationary bicycle 18.

Ex. 1013, 4:39-45.

Next, in a selection step 110, the user decides whether he wants to select his own training program for that session or if he would like the system 12 to select the program. **If the user selects the program, he creates a user “script” of what kind of exercise program he would like to perform that day.** For example, if the user wishes to simply bicycle at a fixed resistance for thirty minutes, that can be entered in step 112. Alternatively, more complex “scripts” can indicate that he would like to bicycle with interval training for thirty minutes, and then do five repetitions on the weight trainer 20.

Ex. 1013, 7:38-48.

The script therefore provides a general framework of a desired exercise session which can be varied based upon human personal trainer input from remote system 14, **user input at local station 12,** and detected user performance at local station 12.

Ex. 1013, 8:10-14.

1. An exercise system comprising:

a local system physically located at a first location and including at least one exercise apparatus having an adjustable resistance and at least one associated local computer having read/write memory, said at least one **local computer controlling and monitoring the**

operation and use, respectively, of said at least one exercise apparatus, wherein said local computer can automatically control the resistance of said exercise apparatus based upon a script stored in said read/write memory of said local computer.

Ex. 1013, excerpt of Claim 1.

617. Accordingly, Clem in view of Hickman renders obvious “*the communication system analyses the user control signals and generates the packetized second signals based upon the analysis of the user control signals,*” as recited in the claim.

L. Independent Claim 78

[78.0] An exercise device for enabling one or more users to select and perform an exercise program stored on a communication system, the exercise device comprising

618. Clem renders obvious “[a]n exercise device for enabling one or more users to select and perform an exercise program stored on a communication system, the exercise device comprising.”

619. Clem teaches an exercise system (“exercise device”) where the user can download new fitness equipment programs (“exercise program”) stored on a web site (“communication system”). See Ground 2 Claim [16].

For example, **the user can interact with the fitness server device from the home of the user.** Using the system of the present invention **the user can download new fitness equipment programs for controlling the exercise equipment.** The user can also interact with

fitness experts on-line and provide exercise information and receive control information wherein the received control information can permit interaction between the fitness server device and the user.

Ex. 1012, Abstract (excerpt).

However, in a preferred embodiment of the fitness system 10 **the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28.** In this preferred embodiment **the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12.** Additionally, a digest of information for each user of fitness system 10 can be accumulated by the web site 12 and the control information can be determined according to the digest as well as the current user location information. For example, **the web site can store a plurality of control programs** and **select a control program from the plurality according to the digest and the current user location information.**

Ex. 1012, 3:1-15.

The exercise system of claim 1, wherein **one of a plurality of control programs is selected according to the user location information.**

Ex. 1012, cl. 17.

620. To the extent it isn't explicit that the user selects and performs the program, a POSITA would have understood that if the user can download based on "user location information," they must be able to input information that selects

that program, as such input is required to select the program from the digest of information accumulated by the web site. Ex. 1012, 3:11-15. Likewise, to the extent it isn't explicit that the user performs the program, a POSITA would have understood that the user will run or walk on the treadmill (*i.e.* perform exercise) at the incline and/or speed settings from the program, as the system is an exercise system, which a POSITA would understand would require the user to exercise. Indeed, Fig. 2A shows that the user performs an exercise on the treadmill. Ex. 1012, Fig. 2A.

621. Indeed, such information was within the knowledge of a POSITA as both Studor and Hickman describe the selection of a program stored on a communication system that the user performs. *See* Ground 1 Limitation [78.0] (describing Studor's selection of a program that the user performs); Ground 2 Limitation [49.3] (describing Hickman's selection of a program that the user performs).

622. A POSITA would be motivated to have the user perform the program selected because otherwise the exercise system as described in Clem would have no purpose. The system is described as "exercise system," and thus the user would perform the program it selected based on the information the user inputted.

623. Thus, Clem renders obvious “*an exercise device for enabling one or more users to select and perform an exercise program stored on a communication system, the exercise device comprising*” as recited in the preamble.

[78.1] an exercise mechanism comprising a movable element for movement in performance of exercise by a user, the exercise mechanism being configured to enable a user to exercise in response to an exercise program selected from one or more exercise programs stored on a remote communication system in network communication with the exercise mechanism; and

624. Clem teaches “an exercise mechanism comprising a movable element for movement in performance of exercise by a user.” See Ground 2 Limitations [1.1]/[29.1], [1.2]/[29.2], [1.3]/[29.3], [49.0], and [49.1]-[49.3]

625. Clem further discloses that the exercise mechanism (the treadmill) is configured to enable a user to exercise in response to an exercise program selected from one or more exercise programs. As discussed above, Clem teaches that the treadmill (including the incline and/or speed) is configured in response the control program selected from the web site. Ex. 1012, Abstract, 2:14-21, 3:1-15; Ground 2 Limitations [1.1]/[29.1], [1.2]/[29.2], [1.3]/[29.3], and [49.0]-[49.5]. Thus the treadmill is configured for the exerciser to perform exercise in response to the exercise program, with its accompanying incline and/or speed parameters.

626. Clem further teaches that the exercise programs are stored on a remote communication system in network communication with the exercise mechanism.

627. Clem discloses a web site (“*a remote communication system*”) which may store the control program (“*exercise program*”) connected to the treadmill over the Internet (comprising “*in network communication with the exercise mechanism*”):

However, in a preferred embodiment of the fitness system 10 **the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28.** In this preferred embodiment **the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12.** Additionally, a digest of information for each user of fitness system 10 can be accumulated by the web site 12 and the control information can be determined according to the digest as well as the current user location information. For example, **the web site can store a plurality of control programs** and **select a control program from the plurality according to the digest and the current user location information.**

Ex. 1012, 3:1-15.

628. Therefore, Clem discloses “*an exercise mechanism comprising a movable element for movement in performance of exercise by a user, the exercise mechanism being configured to enable a user to exercise in response to an exercise program selected from one or more exercise programs stored on a remote*

communication system in network communication with the exercise mechanism”

as recited in the claim.

[78.2] control means, communicating with the exercise mechanism, for receiving one or more packetized control signals from the remote communication system indicative of the selected exercise program and for changing one or more operating parameters of the exercise mechanism based upon the selected exercise program and the one or more packetized control signals.

629. Clem renders obvious a controller (“*control means*”) communicating with the exercise mechanism and receiving one or more packetized control signals from the remote communication system indicative of the selected exercise program. See Ground 2 Limitations [1.3]/[29.3], and [49.3].

630. Clem further renders obvious a controller (“*controls means*”) for changing one or more operating parameters of the exercise mechanism based upon the selected exercise program and the one or more packetized control signals. See Ground 2 Limitations [1.4]/[29.4], and [49.4].

* * *

631. Given the above, Claim 78 is obvious over Clem.

M. Claim Dependent on Claim 78

1. Claim 79

[79] An exercise device as recited in claim 78, wherein the selected exercise signals comprise at least one audio signal and at least one video signal

632. Clem renders obvious “*the selected exercise signals comprise at least one audio signal and at least one video signal.*” See Ground 2 Claim [3].

2. Claim 80

[80] An exercise device as recited in claim 78, wherein the communication system comprises one or more storage devices adapted to store the one or more exercise programs.

633. Clem renders obvious “*the communication system comprises one or more storage devices adapted to store the one or more exercise programs.*” See Ground 2 Claim [16].

3. Claim 81

[81] An exercise device as recited in claim 78, wherein the network is selected from the group consisting of a local area network, a wide area network, and the Internet.

634. Clem renders this limitation obvious. See Ground 2 Claim [57].

4. Claim 82

[82] An exercise device as recited in claim 78, wherein the exercise mechanism includes one or more actuators configured to vary one or more operating parameters of the exercise mechanism.

635. Clem discloses that “*the exercise mechanism includes one or more actuators configured to vary one or more operating parameters of the exercise mechanism.*”

636. Clem expressly states that there are a “plurality of resistance mechanisms,” (“*actuators*”) including “a speed-varying mechanism” and a “grade-adjustment mechanism.” These mechanisms are configured to vary the incline and speed. See Ground 2 Limitations [1.4]/[29.4], [49.5], and [78.2].

Referring now to FIGS. 2A-C, there is shown an exercise apparatus 32 **having a plurality of resistance mechanisms**, wherein the exercise equipment 32 is shown as a treadmill.

Ex. 1012, 3:64-66.

In the fitness device 32 **the first resistance mechanism 13 is a speed-varying mechanism and the second resistance mechanism is a grade-adjustment mechanism 15**. In order to **vary the speed of the fitness device 32**, and thus increase the resistance of the first resistance mechanism 13, **a variable-speed drive motor 16 is mechanically coupled in a conventional manner by a drive belt 19 to a drive roller 21 to rearwardly move a continuous belt 23.**

Ex. 1012, 4:7-15.

To vary the grade or incline angle of the rotating treadmill surface a conventional motor-driven windlass can be used. **This alters the resistance of the second resistance mechanism 15 and alters the amount of exertion required by the user to remain on the apparatus 32. An incline motor 36 is mechanically coupled at its shaft 35 to a drum 38 or cylinder 38 provided for this purpose.** The drum 38 is provided with a cable 40 so that rotating the drum 38 winds or unwinds the cable 40 to raise or lower a lift frame 48 as the incline motor 36 is operated.

Ex. 1012, 4:34-43.

637. Therefore, Clem discloses that “*the exercise mechanism includes one or more actuators configured to vary one or more operating parameters of the exercise mechanism,*” as recited in the claim.

5. Claim 83

[83] An exercise device as recited in claim 78, wherein the control means comprises at least one decoder configured to decode the one or more packetized control signal and at least one processor configured to activate the one or more actuators in response so [sic] the one or more decoded control signals.

638. Clem renders obvious “*the control means comprises at least one decoder configured to decode the one or more packetized control signal and at least one processor configured to activate the one or more actuators in response so [sic] the one or more decoded control signals.*”

639. A POSITA would have understood Clem discloses a controller with a microprocessor that can receive a control program (“*packetized control signal*”) from the remote web site over the internet. *See* Ground 2 Limitations [1.3]/[29.3]. In response to the packetized control signal, the microprocessor (“*processor*”) in the controller provides control signals to activate the motors in response to the control signals. As I showed in Fig. 3 below, the signal comes from the web site over the internet (purple), through the controller (green), which includes a processor configured to activate the motors (pink) in response to the control program.

However, in a preferred embodiment of the fitness system 10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28. In this preferred embodiment the **controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12.**

Ex. 1012, 3:1-7.

Referring now to FIG. 3, there is shown a block diagram **representation of the controller 28** of the programmable fitness device 32. **The controller 28 can include a microprocessor 72,** a memory 74, a timer 75 and input/output (I/O) circuitry 76 connected in a conventional manner.

Ex. 1012, 5:1-5.

Conventional circuitry for latching output signals from the microprocessor 72 is also ordinarily included in the output circuitry 76. Thus, **output signals from the microprocessor 72, interfaced though the output circuitry 76, control the drive motor 16 and incline motor 36.**

Ex. 1012, 5:9-15.

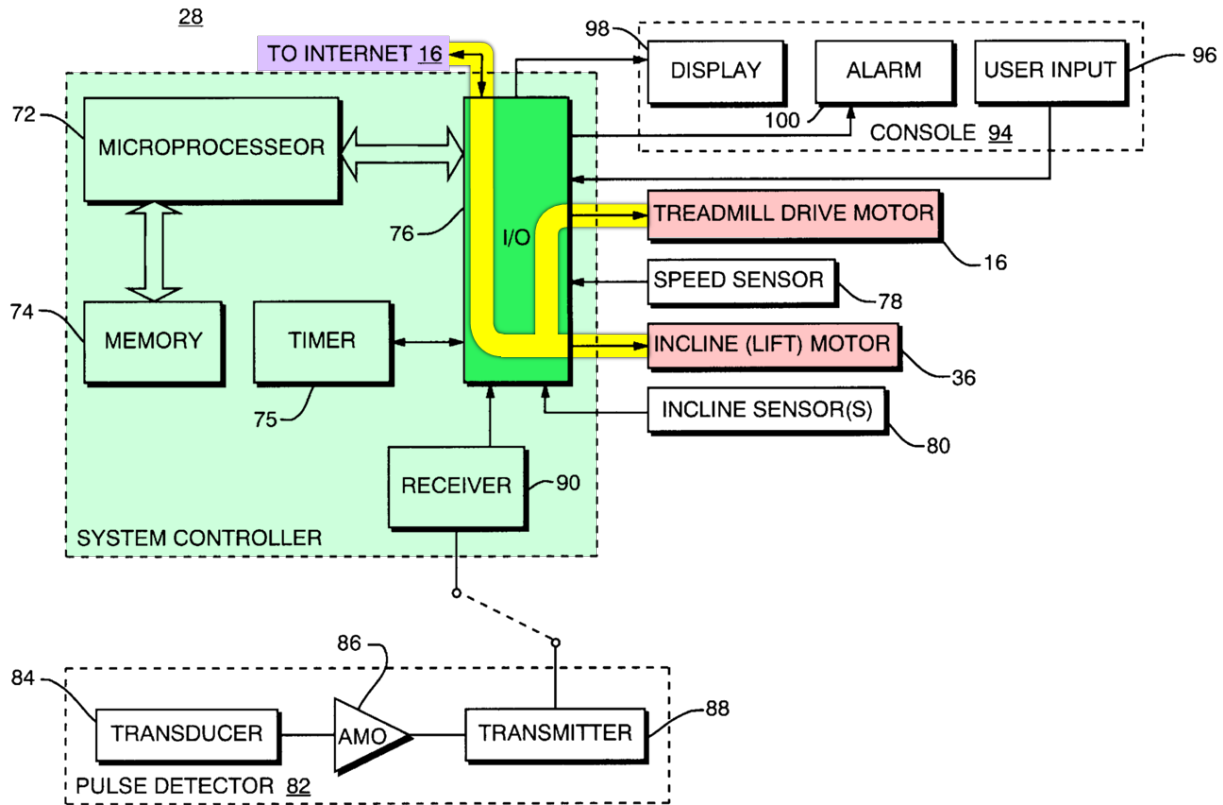


FIG. 3

Ex. 1012, Fig. 3 (annotated)

640. Although Clem does not explicitly use the words “decoder,” a POSITA would have understood that the controller in Clem is or includes a decoder to decode the control program data, which is a digital signal since it is received in packets over the internet, to provide control signals required for controlling motors, which typically require variable current or voltage to control the speed. Without a way to decode the digital signal into a current or voltage, Clem would be unable to use the control program data to control the motors at all.

641. Thus, Clem renders obvious at least one processor configured to activate the one or more actuators in response to the one or more decoded control signals.

642. Therefore, Clem renders obvious “*the control means comprises at least one decoder configured to decode the one or more packetized control signal and at least one processor configured to activate the one or more actuators in response so [sic] the one or more decoded control signals,*” as recited by the claim.

6. Claim 84

[84] An exercise device as recited in claim 78, wherein the communication system comprises:

643. Clem teaches a remote communication system. See Ground 2 Limitations [78.0]-[78.2].

[84.1] (a) one or more storage devices adapted to store the one or more audio and video signals;

644. Clem in view of Hickman renders obvious “*one or more storage devices adapted to store the one or more audio and video signals.*” See Ground 2 Claim [16].

645. To the extent that it isn’t explicit in Clem, a POSITA would have understood the device that stores the control programs in Clem could store one or more audio/video signals. The signals sent from the web site to the treadmill

include audio/video signals and storing control programs. Ground 2 Limitation [49.3], Claim [54].

646. In addition, as I discussed previously, storage of audio and video signals was known to a POSITA. Ground 1 Limitation [84.1].

647. A POSITA would have been motivated to adapt the storage device to store audio and video signals. By storing these signals with the control program in Clem, the user could receive a full workout program, including previously recorded instructions from the trainer.

[84.2] (b) a control signal generator configured to generate one or more control signals; and

648. Clem discloses “*a control signal generator configured to generate one or more control signals.*” See Ground 2 Claim [15], Limitation [49.3].

[84.3] (c) a control processor configured to synchronize and packetize the controls signals with the one or more audio and video signals and deliver the packetized control signal to the exercise mechanism.

649. Clem in view of Hickman renders obvious “*a control processor configured to synchronize and packetize the controls signals with the one or more audio and video signals and deliver the packetized control signal to the exercise mechanism.*”

650. Clem teaches that there is a web site that can send “video and audio information” during a “real time two way communication” between “a live fitness

expert located at the web site 12” and the user on the treadmill. Ex. 1012, 2:53-65. Clem also teaches that user “can interactively obtain the control information from a computer located at the web site 12,” to, for example, control the incline and speed of the treadmill. Ex. 1012, 2:60-64, 3:1-7. Thus Clem discloses the web site sending both a video and audio signal and a control signal. *See* Ground 2 Limitations [1.3]/[29.3].

651. A POSITA would have understood that the computer at the web site includes a “control processor” and that it can packetize, synchronize and send over the internet video and audio signals as part of the two way communication as well as control signals to control the motors. Indeed, such a processor was known to a POSITA, as was shown by Studor. *See* Ground 1 Limitation [84.3] (describing Studor’s disclosure of the claimed control processor).

652. And, as I have already described, Clem in view of Hickman renders obvious synchronizing a control signal with at least one of audio and visual signal. *See* Ground 2 Claims [4], [52].

653. For example, Hickman teaches a remote system having a remote computer (“*control processor*”). This remote computer can “download new exercise scripts or programs to the local system computer” over the internet (“*packetized control signal*”) which while also having the personal trainer associated with the remote system provide vocal instructions or encouragement

while the user performs the workout. Such instructions can be simultaneous, as the script can include audio for telling the user that they are “approaching a hill” and that there will be an “increased resistance” while accompanied by a control signal increasing the resistance. As such, Hickman teaches the claimed control processor.

The system further includes **a remote system having a remote computer**, and a transmission medium including a telephone line that couples the local system to the remote system for data communication between the local system and the remote system. The remote system may receive local system data from the local system concerning the use of the exercise apparatus, and **the local system may receive remote system data from the remote system concerning the operation of the exercise apparatus**. The **local computer preferably controls the operation of the exercise apparatus based upon a modifiable script stored in a read/write memory of the local computer, which can be updated by the remote system**. A method for controlling an exercise apparatus includes running a **modifiable script on a local computer to control the use and to monitor the operation of an exercise apparatus, and communicating with a remote system to provide the remote system with data** concerning the use of the exercise apparatus. The script is stored in read/write memory of the local computer and **remote system data received from the remote system may include at least a portion of a new script to be stored in the read/write memory of the local computer**.

Ex. 1013, Abstract.

The remote system computer is preferably associated with a number of exercise and health locations. **The remote system computer can be considered to be the communication tool of a human personal trainer**, as opposed to the “virtual personal trainer” emulated by software in the local system computer. For example, the remote system computer can be associated with one hundred local systems (used by one or more individuals in, for example, their homes), and can be used to upload information from the exercise and health equipment of a local system to be analyzed by the personal trainer at the remote computer. The personal trainer can then call the individual user to provide additional instruction, encouragement, and cautions, and **the remote system computer can download new exercise scripts or programs to the local system computer** to implement these changes.

Ex. 1013, 2:31-45.

The loudspeaker 58 provides another important communication medium to the user of the stationary bicycle 18. For example, under computer 24 control, **the user can be told with either a digitally synthesized or digitally recorded voice to pedal faster, pedal slower, that they are doing a good job, etc.** Of course, analog recording techniques can be used as well, but are considered to be less flexible and desirable. Preferably, **the voice being used is that of the personal trainer associated with the remote system 14 that oversees that local system 12.** Both voice synthesis and digital voice

recording on computer systems 24 are well known to those skilled in the art.

Ex. 1013, 5:6-18.

The **computer 24** is also coupled to a modem 62 for communication over a telephone line 30. Alternatively, the computer 24 can be coupled to the remote computer 14 by other communication linkages, such as ISDN digital transmission line, via a local area network, or **via a wide area network (WAN) such as the Internet.** In other words, the telephone line 30 represents only one type of data communication channel between the local systems 12 and the remote system 14.

Ex. 1013, 5:39-48.

Next, in a step 140, it is determined if a script preview should be provided. If yes, a **step 142 provides an auditory, visual or other type of preview of upcoming script events.** For example, the system 12 could be taking a user on a imaginary bicycle ride through the country. **The script preview would then, in a step 142, indicate something like “We are now approaching a hill. You will note an increased resistance to pedaling in a few seconds which will steadily increase until we reach the crest of the hill in about one and a half minutes.”** These steps 134, 138, and 142 are further examples of the local system 12 serving as a “virtual personal trainer.” The process 116 is completed at step 144.

Ex. 1013, 9:4-15.

654. Therefore, Clem in view of Hickman renders obvious “*a control processor configured to synchronize and packetize the controls signals with the one or more audio and video signals and deliver the packetized control signal to the exercise mechanism,*” as recited by the claim.

655. Thus Clem in view of Hickman renders obvious Claim 84.

F. Independent Claim 85

[85.0] An exercise system comprising:

656. Clem teaches a system (“*exercise system*”) that includes a “fitness system 10” with programmable fitness device being a treadmill as shown in Fig. 2A, below:

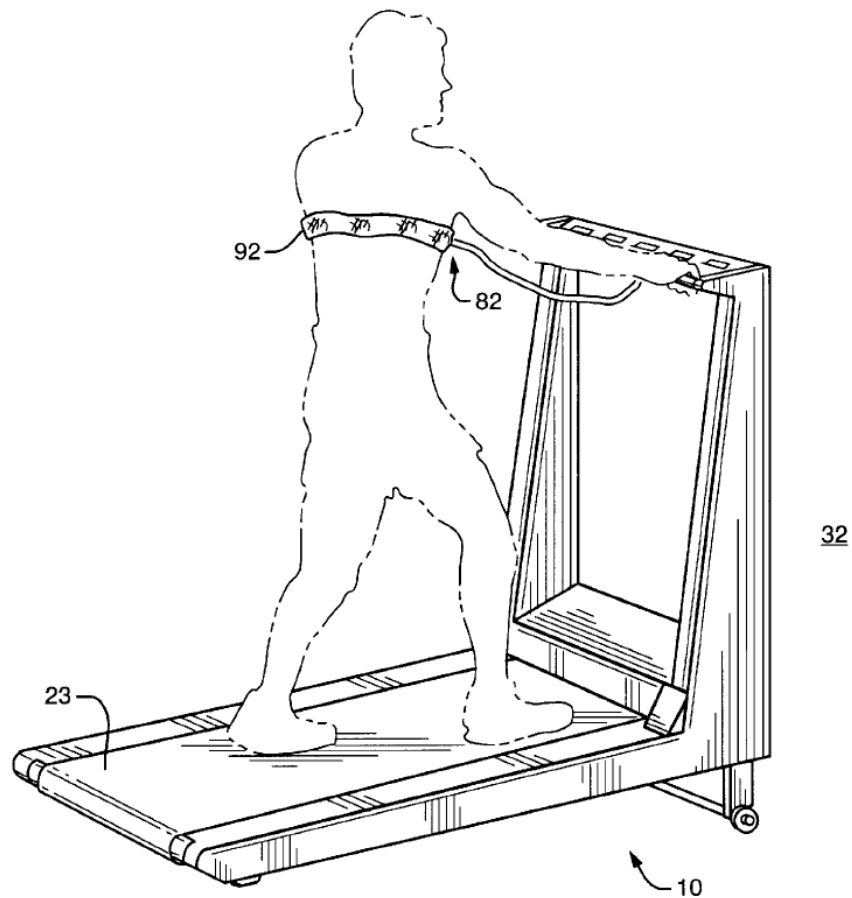


FIG. 2A

Ex. 1012, Fig. 2A

657. Clem teaches that that the treadmill is exercise equipment.

Referring now to FIGS. 2A-C, **there is shown an exercise apparatus 32** having a plurality of resistance mechanisms, wherein the **exercise equipment 32 is shown as a treadmill.**

Ex. 1012, 3:64-66.

658. Thus, Clem discloses an “*exercise system*” as recited in the preamble, and as discussed in more detail below.

[85.1] (a) a local system including at least one exercise apparatus to an associated local computer;

659. Clem discloses an exercise system that includes a local system at the user location (“*local system*”) with a programmable fitness device (“*exercise apparatus*”) associated to a controller with a microprocessor (“*associated local computer*”).

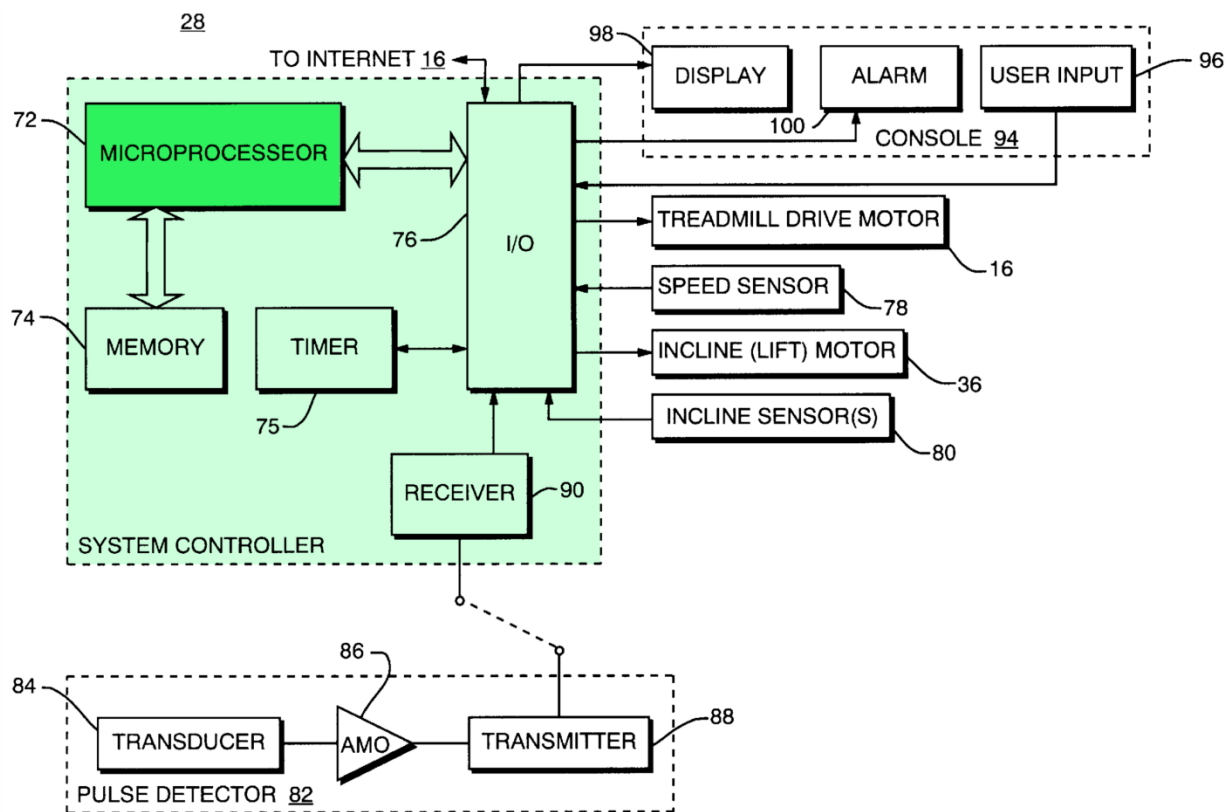


FIG. 3

Ex. 1012, Fig. 3 (annotated)

660. The controller at the user's location includes a microprocessor and is a computer according to the '062 patent, which states that a computer can be a "microprocessor-based or programmable consumer electronic[]."

Those skilled in the art will appreciate that computer 14 may take various configurations, including personal computers, hand-held devices, multi-processor systems, **microprocessor-based or programmable consumer electronics,** telephones, network PCs, minicomputers, mainframe computers, **and the like**. Additionally, computer 14 may be part of a distributed computer environment where tasks are performed by local and remote processing devices that are linked (either by hardwired links, wireless links, or by a combination of hardwired or wireless links) through a communications network, such as network 16. Furthermore, as suggested earlier, treadmill 12 may optionally incorporate the functionality of personal computer 14 therein or include one or more modules or components of computer 14 while not incorporating all the modules and components of computer 14.

Ex. 1001, 13:67-14:15.

661. As shown in Figure 1 and discussed throughout Clem, the controller is part of the user (*i.e.* local) location (shown by 34).

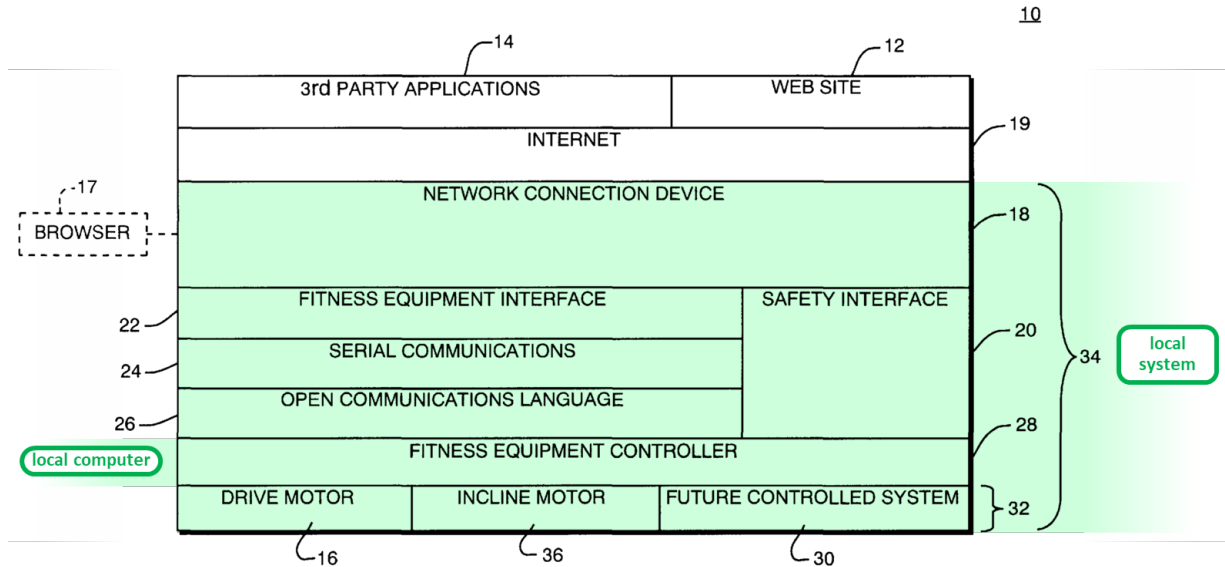


FIG. 1

Ex. 1012, Fig. 1 (annotated)

662. Thus, Clem discloses “a local system including at least one exercise apparatus to an associated local computer” as recited in the claim.

[85.2] (b) a remote system including a least one remote computer; and

663. Clem renders obvious a remote system which includes a computer. Clem states that “a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12.” Ex. 1012, 2:60-65. The computer is located away from the user, and is therefore a “remote computer.” The web site together with the computer on which it is located constitute a “remote system.”

664. Further, Clem teaches that a user at a user location can interact on-line with a live fitness expert located at the web site. A POSITA would understand that the web site is hosted on a remote computer and that the fitness expert could communicate through it. Generally, web sites are hosted on server computers remote from a user that allow access to the web site through the Internet.

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment. For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, **a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12. The communication can include the uploading and downloading of video and audio information.**

Ex. 1012, 2:53-65.

665. Thus, Clem renders obvious “*a remote system including a least one remote computer*” as recited in the claim.

[85.3] (c) a communication link for communicating packetized data between the local computer and the remote system, such that the local system may receive remote system data from the remote system, including packetized control signals for controlling operation of the at least one exercise apparatus.

666. Clem teaches an “internet system” (comprising a “*communication link*”) which communicates “control information from a computer located at the web site 12” to the user through the controller (“*local computer*”) at the user’s location (“*local system*”). Ex. 1012, 2:60-64. This communication includes video and audio information that is part of a two way communication between a live fitness expert at the remote computer and the user. Ex. 1012, 2:64-65. Such video and audio information from the web site (part of the “*remote system data from the remote system*”) is sent over the internet and received by the controller at the user location (“*local system*”). See Ground 2 Limitations [1.3]/[29.3].

Using the fitness system 10, a user at a user location 34 can interact on-line with a live fitness expert located at the web site 12 to engage in a real time two way communication regarding matters related to fitness, including matters such as exercise routines and exercise equipment. For example, the user can obtain advice on modifying an exercise routine as well as technical support information for various kinds of exercise equipment. In addition to interacting, including conversing, with a live fitness expert, **a user of the fitness system 10 at the user location 34 can interactively obtain the control information from a computer located at the web site 12. The communication can**

include the uploading and downloading of video and audio information.

Ex. 1012, 2:53-65.

The fitness system 10 includes a programmable fitness device 32 interactively coupled with a web site 12. The fitness device 32 is disposed at a user location 34 at a location that is geographically remote from the web site 12. **The interactive coupling between the fitness device 32 and the web site 12 can be by way of an internet system 19. The interactive coupling permits the fitness device 32 to transmit various kinds of user location information to the web site 12. It also permits the web site 12 to transmit control information to the user location 34 to control, for example, drive motor 16 and incline motor 36 of exercise device 32. Thus the web site 12 can operate as a server device for the user.** Information can be transmitted between the fitness device 32 and the web site 12 at any time, including immediately prior to an exercise session using fitness device 32 and during such an exercise session.

Ex. 1012, 2:2:36-52.

The user location 34 interactively applies and receives **the interactive information to the internet system 19 by way of network connection device 18. The network connection device 18 can be a network computer, a personal computer, a cable television box, or any other suitable connection device.** The user location information **transmitted by way of the network**

connection device 18 can include personal information identifying or describing the user to the web site 12. For example, in addition to a user password if desired, **the user location 34 can provide user information such as user heart rate, weight, age and gender.**

Ex. 1012, 3:34-47.

Device information such as speed, incline and suspension can also be communicated by the user or **automatically by way of the internet system 19.** **Any other information useful for interaction between the user location 34 and the web site 12 can also be applied to the internet system 19.** The user information and the device information can be used by the web site 12, as well as by the controller 28, to calculate, for example, calorie information. **Calorie information calculated in this manner can be used to provide control signals for controlling the fitness device 32 according to the calorie information,** both in a current exercise session and in a future one. **Information within the fitness system 10 can also be interactively communicated** to and **from third party applications 14.** An internet browser 17 can be coupled to the network connection device 18. The internet browser 17 permits the user of fitness system 10 to browse the internet system 19 both during and between exercise sessions.

Ex. 1012, 3:47-63.

667. Clem also teaches transmission of control signals from a web site over the internet to control the motors of the treadmill (part of the “*remote system data from the remote system,*” also “*packetized control signals for controlling operation of the at least one exercise apparatus.*”). This control of the motors can be direct or indirect through a control program.

The control information transmitted from the web site 12 can include control signals for directly controlling the fitness device 32. However, in a preferred embodiment of the fitness system 10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28. In this preferred embodiment the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12. Additionally, a digest of information for each user of fitness system 10 can be accumulated by the web site 12 and the control information can be determined according to the digest as well as the current user location information. For example, the web site can store a plurality of control programs and select a control program from the plurality according to the digest and the current user location information.

Ex. 1012, 2:66-3:14.

668. The below Fig. 3 shows how the internet (“*communication link*”) (in purple) communicates (signal pathway in yellow) packetized data from the remote

system to control either what is displayed on the display in console (in orange) or control the motors of the treadmill (in pink).

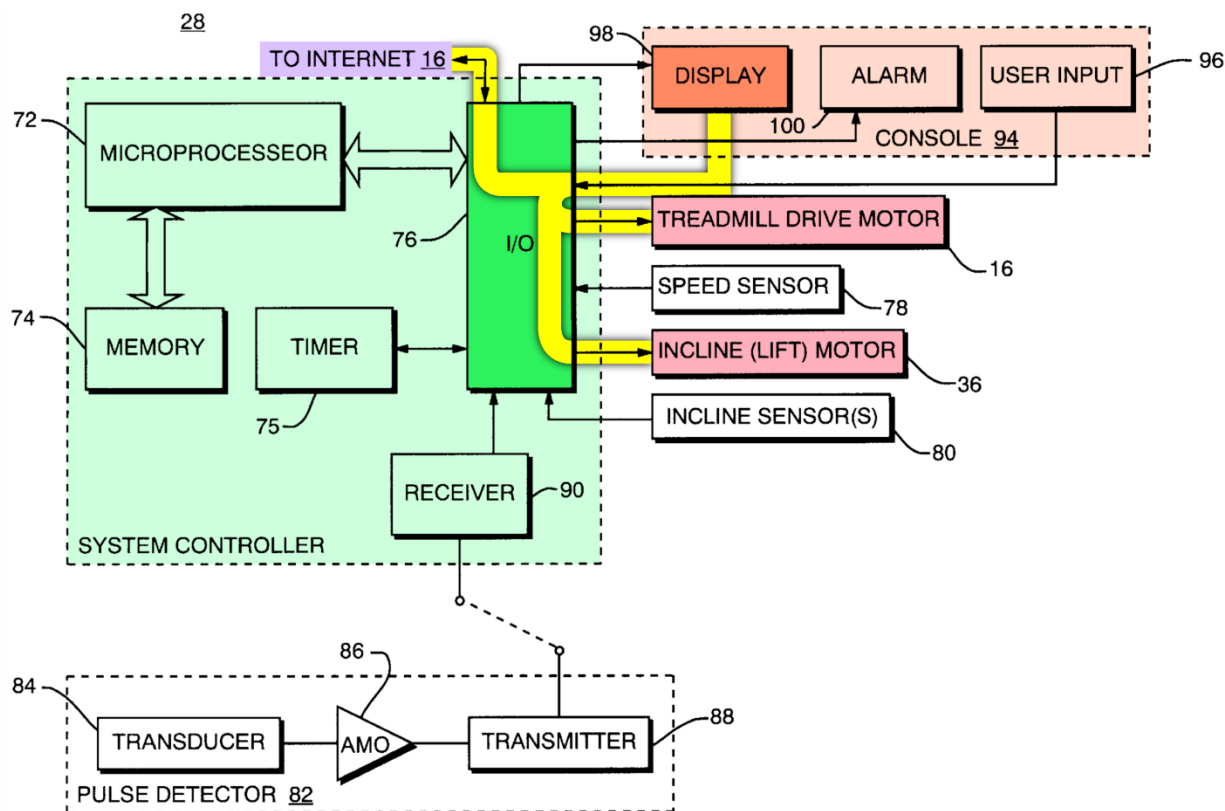


FIG. 3

Ex. 1012, Fig. 3 (annotated)

669. A POSITA would understand that the information communicated over the internet system is packetized data. A POSITA would understand that all communications over the Internet utilizes the Internet Protocol, which specifies that all data are carried in packets. *See, e.g.*, Ex. 1024, 1 (“The Internet Protocol is designed for use in interconnected systems of packet-switched computer communication networks...The internet protocol provides for transmitting blocks

of data called datagrams from sources to destinations, where sources and destinations are hosts identified by fixed length addresses.”).

670. Thus Clem renders obvious “*a communication link for communicating packetized data between the local computer and the remote system, such that the local system may receive remote system data from the remote system, including packetized control signals for controlling operation of the at least one exercise apparatus*” as recited by the claim and thus Clem renders obvious Claim 85 of the ’062 patent.

* * *

671. Given the above, claim 85 is obvious over Clem.

G. Claims Dependent on Claim 85

1. Claim 87

[87.1] An exercise system as recited and claim 85, wherein the one or more control signals correspond to an exercise program selected by a user of the least one exercise apparatus.

672. Clem teaches control information (“*control signals*”) that can be “one of a plurality of control programs” (“*exercise program*”) selected according to the user location information. Ex. 1012, cls. 16-17. Clem further includes an invention where “the user can download new fitness equipment programs for controlling the exercise equipment.” Ex. 1012, Abstract. A POSITA would understand that the user is selecting and downloading new programs. And in response, the selected

program can control the exercise equipment. Ex. 1012, 2:15-17, 3:1-14. Thus, Clem renders obvious a control signal that corresponds to an exercise program selected by the user of the exercise apparatus. *See* Ground 2 Limitations [1.2]/[29.2], [1.3]/[29.3], [49.2], [49.3], [78.1], and [78.2].

Thus, the present invention is an interactive fitness system for permitting a user of a programmable exercise device to interact with a fitness server device while the user is in a location remote from the fitness server device. For example, the user can interact with the fitness server device from the home of the user. **Using the system of the present invention the user can download new fitness equipment programs for controlling the exercise equipment.** The **user can also interact with fitness experts on-line and provide exercise information and receive control information wherein the received control information can permit interaction between the fitness server device and the user.**

Ex. 1012, Abstract.

Thus, the present invention is an interactive fitness system for **permitting a user of a programmable exercise device to interact with a fitness server device while the user is in a location remote from the fitness server device.** For example, the user can interact with the fitness server device from the home of the user. **Using the system of the present invention the user can download new fitness equipment programs for controlling the exercise equipment.** The user can also interact with fitness experts on-line and provide exercise

information and receive control information wherein the received control information can permit interaction between the fitness server device and the user.

Ex. 1012, 2:10-21.

However, in a preferred embodiment of the fitness system 10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28. In this preferred embodiment the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12. Additionally, a digest of information for each user of fitness system 10 can be accumulated by the web site 12 and the control information can be determined according to the digest as well as the current user location information. For example, the web site can store a plurality of control programs and select a control program from the plurality according to the digest and the current user location information.

Ex. 1012, 3:1-14.

16. The exercise system of claim 1, wherein the control information comprises a control program for operating the exercise device by the controller according to the control program.

17. The exercise system of claim 1, wherein one of a plurality of control programs is selected according to the user location information.

Ex. 1012, cls. 16-17.

673. Further, a POSITA would be motivated to include the claimed control signal into Clem. As recognized by Clem, it was known how to vary the resistance according to a stored program to achieve target heart rates or to increase the resistance within exercise equipment. Ex. 1012, 29-39. As such, a POSITA would be motivated to have the user select a program (as was known and as discussed in Clem) to achieve a target heart rate.

674. Additionally, the Clem-Hickman combination renders obvious this claimed limitation. Hickman teaches selection of an exercise program (“*exercise program*”) which creates a script for the exercise program that the user of the stationary bicycle (“*exercise apparatus*”) would like to perform that day. If the exercise program is modifiable, the program can be modified based on the selected script and upon user activity or other input. For example, if the heart rate is too high, a control signal corresponding to the exercise program can be sent to the brake to reduce the resistance (“*control signal*”).

675. A POSITA would be motivated to include the claimed control signal into Clem. In having a control signal correspond to an exercise program, the exercise program simplifies the actions necessary for a user to perform a workout, as the user does not need to manually adjust resistances to perform the workout according to the workout. Rather the workout itself controls the resistance and other parameters accordingly.

676. Thus Clem in view of Hickman renders obvious “*one or more control signals correspond to an exercise program selected by a user of the least one exercise apparatus*” as recited by the claim.

2. Claim 89

[89.1] An exercise system as recited in claim 85, wherein the remote system remotely controls an operation of the local computer based upon the packetized control signals.

677. Clem renders obvious a web site (part of a “*remote system*”) that controls the operation of the controller (“*local computer*”) device based on packetized control signals. As previously discussed and discussed in Claim 1 of Clem, the controller receives packetized control signals from the web site. Ground 2 Limitation [1.3]/[29.3]. And as discussed, these signals are packetized and control the operation of the controller and the fitness device. *See* Ground 2 Limitations [1.3]/[29.3], [1.4]/[29.4], [49.3], [49.5] and [78.2] (discussion of packetized control signals controlling controller).

Thus, the present invention is **an interactive fitness system for permitting a user of a programmable exercise device to interact with a fitness server device** while the user is in a location remote from the fitness server device. For example, **the user can interact with the fitness server device from the home of the user**. Using the system of the present invention **the user can download new fitness equipment programs for controlling the exercise equipment. The user can also interact with fitness experts on-line and provide**

exercise information and receive control information wherein the received control information can permit interaction between the fitness server device and the user.

Ex. 1012, Abstract.

However, in a preferred embodiment of the fitness system 10 the control information from the web site 12 can be a fitness equipment control program for execution by the controller 28. In this preferred embodiment **the controller 28 provides the control signals required for controlling motors 16, 36 according to the control program received from the web site 12.**

Ex. 1012, 3:1-7.

1. An exercise system including an exercise device at a user location, comprising:

a controller at the user location for controlling the exercise device;

an automated control location remote from the user location;

a communication system for transmitting information between the exercise device and the automated control location;

a sensor at the user location for determining user identifying information and applying the user identifying information to the communication system for transmission to the automated control location; and

control information applied to the communication system by the automated control location in response to the user identifying information for transmission to the controller to control the exercise device according to the control information, wherein the control information is automatically derived by the automated control location from a database derived at the automated control location based on the user identifying information.

Ex. 1012, Claim 1.

678. Thus, Clem renders obvious “*wherein the remote system remotely controls an operation of the local computer based upon the packetized control signals*” as recited in the claim.

3. Claim 90

[90.1] An exercise system as recited in claim 85, further comprising one or more input devices gathering a signal from a user of the at least one exercise apparatus, the one or more input devices being selected from a group consisting of audio and video.

679. Based on their Preliminary Infringement Contentions, iFIT interprets “consisting of” to mean “including at least one of.” Ex. 1014, 64-65. I have been instructed by counsel to interpret “consisting of” the same way.

680. Clem renders obvious this limitation. *See* Ground 2 Claims [8]/[30].

681. To the extent “consisting of” is a so-called “closed group,” Studor renders this limitation obvious. It would have been obvious to a POSITA to choose only audio and video input devices. Audio and video input devices were part of a

finite number of possible choices that a POSITA would have chosen. A POSITA would have had good reason to try audio and video input devices and would have been a matter of design choice.

682. Thus, Clem renders obvious “*one or more input devices gathering a signal from a user of the at least one exercise apparatus, the one or more input devices being selected from a group consisting of audio and video*” as recited in the claim.

4. Claim 92

[92.1] An exercise system as recited in claim 85, wherein the packetized control signals are synchronized with at least one of an audio signal or a video signal.

683. Clem in view of Hickman teaches this limitation. See Ground 2 Claim [4].

684. Thus Clem in view of Hickman teaches “*the packetized control signals are synchronized with at least one of an audio signal or a video signal*” as recited in the claim.

5. Claim 93

[93.1] An exercise system as recited in claim 85, wherein the communication link comprises a network connection.

685. Clem teaches an “internet system” which includes a network connection between the network connection device (at the user location) and the web site. Ex. 1012, Fig. 1, 3:33-46; see Ground 2 Claims [56]-[57], and [81].

686. As shown in Figure 1 below, the network connection device sits between the internet and the fitness equipment and safety interface:

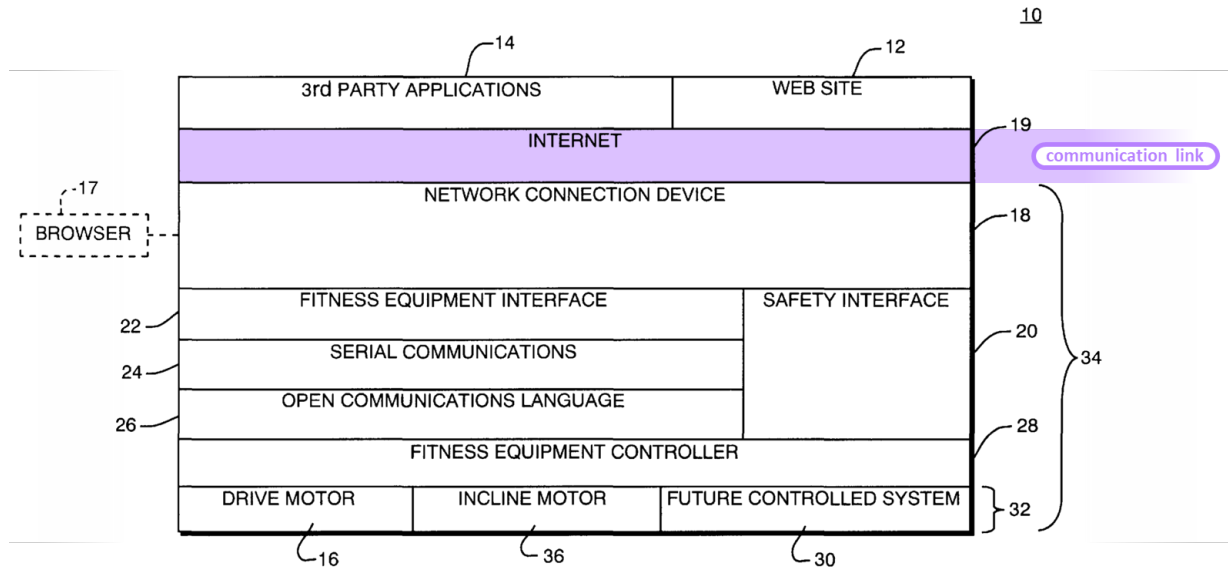


FIG. 1

Ex. 1012, Fig. 1 (annotated)

687. The network connection device will create a network connection to the internet system 19 to allow the user of the fitness system 10 to receive interactive information from the Internet. As Clem explains:

Using the internet system 19 the user of the fitness system 10 can provide user location information from the user location 34 to the web site 12. The user location 34 interactively applies and receives the interactive information to the internet system 19 by way of network connection device 18. The network connection device 18 can be a network computer, a personal computer, a cable television

box, or any other suitable connection device. The user location information transmitted by way of the network connection device 18 can include personal information identifying or describing the user to the web site 12. For example, in addition to a user password if desired, the user location 34 can provide user information such as user heart rate, weight, age and gender.

Ex. 1012, 3:33-46.

688. Thus, Clem discloses “*wherein the communication link comprises a network connection*” as recited in the claim.

6. Claim 94

[94.1] An exercise system as recited in claim 85, wherein the exercise apparatus comprises one or more sensors for detecting data representative of the status of the exercise apparatus is configured to transmit the data to the remote system via the communication link.

689. As discussed previously, Clem includes a fitness device with both a speed and incline sensors (“*one or more sensors*”) that detect data representative of the speed and incline of the treadmill. *See* Ground 2 Claim [40]. Clem further discloses that this information, which is representative of the operation of any of the devices included in the controller” can be “interactively transmitted between the user location” and “the web site 12 by way of I/O circuitry.”

It will be understood that **information representative of the operation of any of the devices included in the controller 28 can be interactively transmitted 20 between the user location 34 and**

the web site 12 by way of I/O circuitry 76 which is coupled to the internet system 19 by way of interface 22.

Ex. 1012, 5:18-23.

Since the speed and grade of the fitness device 32 is determined by the controller 28, the controller 28 normally has all speed and grade information required to the fitness control device 32. However, it is preferable to include a speed sensor for detecting the actual speed of the fitness device 32 and an incline sensor for determining the actual grade. Sensors suitable for this purpose are well known to 30 those skilled in the art. For example, a speed sensor 78 can be a conventional Hall effect type sensor adapted to provide a value to the controller 28 that indicates the revolutions per minute of the drive roller 21. The controller 28 can then convert the value received from speed sensor 78 to miles per 35 hour. The incline sensor 80 can be any conventional sensor suitable for the purpose.

Ex. 1012, 5:24-37.

690. Thus, Clem discloses that the “*exercise apparatus comprises one or more sensors for detecting data representative of the status of the exercise apparatus is configured to transmit the data to the remote system via the communication link*” as recited in the claim.

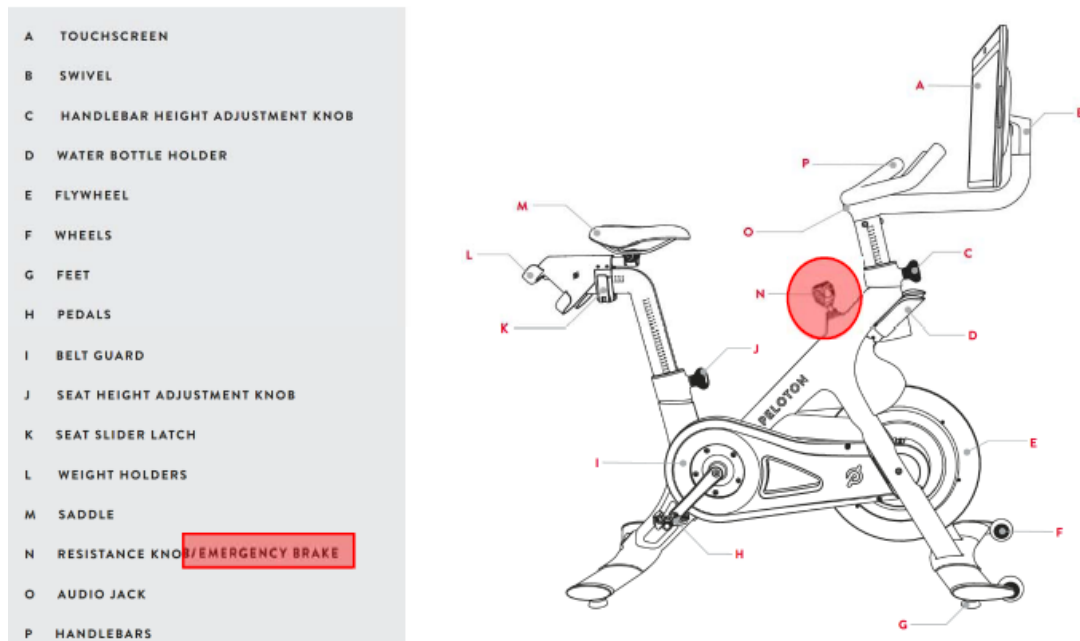
7. Claim 95

[95.1] An exercise system as recited in claim 85, further comprising a safety mechanism in communication with the at least one exercise apparatus, the

safety mechanism manipulating the at least one exercise apparatus in the event that a packetized control signal is interrupted.

691. For purposes of this IPR, I have been asked to construe this limitation based on how iFIT has apparently construed it in the district court litigation. I have been informed that in the district court, iFIT has stated that an emergency brake “is capable of manipulating the operating parameters by immediately stopping the flywheel upon activation of the emergency brake” and that iFIT has taken the position that the emergency brake is capable of immediately stopping the flywheel in the event the packetized second control signal is interrupted, as shown below.

The Bike+ further comprises a safety mechanism in the form of, for example, an emergency brake.



Peloton Bike+ Manual, p. 10–11 (PELOTON_ICON2_007903)

The emergency brake is capable of manipulating the operating parameters by immediately stopping the flywheel upon activation of the emergency brake.

The resistance knob can be used as an emergency brake. To stop immediately, push down on the resistance knob.

► Replace with

This bike has a direct driven flywheel. If the flywheel is moving, the pedals are moving. Removing your feet from the pedals while they are moving can cause serious injury. Stop by reducing pedaling frequency in a controlled manner or by using the emergency brake. Do not remove your feet from the pedals until the flywheel stops moving.

Peloton Bike+ Manual, p. 4 (PELTON_ICON2_007900)

- **Emergency brake:** Press down on the resistance knob while pedaling slowly. The flywheel should come to a complete stop immediately. If it does not, stop using the bike immediately and contact Peloton Support.

Peloton Bike+ Manual, p. 40 (PELTON_ICON2_007918)

On information and belief, in the event the packetized second control signal (i.e., JSON information) is interrupted, the emergency brake is capable of immediately stopping the flywheel.

Ex. 1014, 64-65.

692. Thus, Clem renders obvious “*a safety mechanism in communication with the at least one exercise apparatus, the safety mechanism manipulating the at least one exercise apparatus in the event that a packetized control signal is interrupted*” as recited in the claim under iFIT’s construction. *See* Ground 2 Claim [38].

X. SECONDARY CONSIDERATIONS

693. I understand that iFIT has submitted evidence of secondary considerations for claim 47 (not at issue here) in IPR2021-00342. I have been

instructed by counsel that such evidence is not currently of record in the present proceeding. If Patent Owner presents any such evidence for the Challenged Claims here, I reserve the right to respond.

XI. CONCLUSION

694. In view of the reasons set forth above, it is my opinion that the Challenged Claims are unpatentable.

Declaration ISO Pet. for *Inter Partes* Review of USP 7,166,062

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: 10/12/2021

A handwritten signature in black ink that reads "Henry H. Houh". The signature is written in a cursive style with a horizontal line underneath it.

Henry H. Houh