Apple Inc. (Petitioner)
v.
LoganTree, LP (Patent Owner)

Petitioner Demonstratives

Case Nos. IPR2022-00037, IPR2022-00040
U.S. Patent No. 6,059,576

Before Hon. Patrick R. Scanlon, Mitchell G. Weatherly, and James A. Worth
Administrative Patent Judges

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

IPR2022-00040 ('040) Issues

FISH.

IPR2022-00037 ('037) Issues

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

’040 / ’037 Common Issue

FISH.

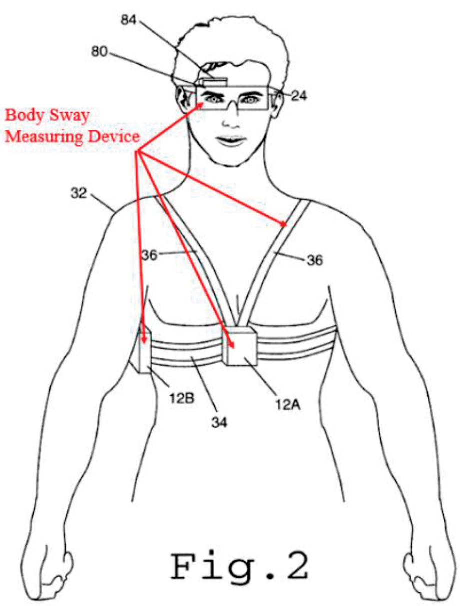
’040 Issue 1

A POSITA Would have been Motivated to Combine Allum, Raymond, and Conlan

FISH.

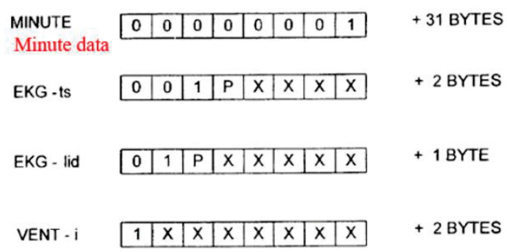
Combination of Allum, Raymond, and Conlan (ARC)

Allum

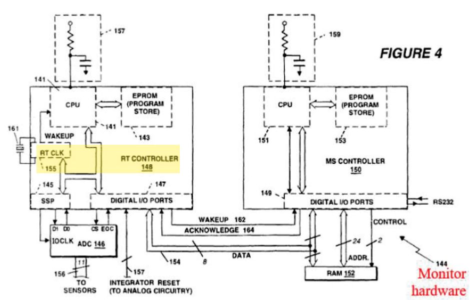


APPLE-1008 (Allum), FIG. 2;
'040 Pet., 6-7; '040 APPLE-1003, ¶¶55-56.

Raymond

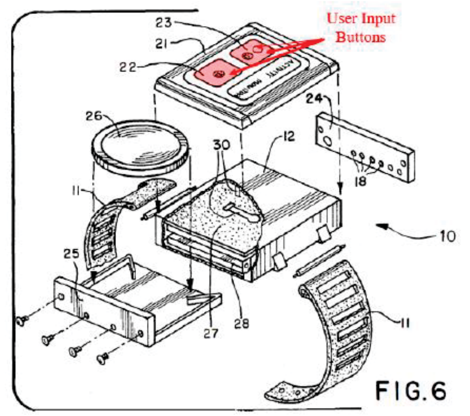


APPLE-1009 (Raymond), portion of FIG. 7;
'040 Pet., 15; '040 APPLE-1003, ¶66.



APPLE-1009 (Raymond), FIG. 4;
'040 Pet., 12-15; '040 APPLE-1003, ¶¶61-66.

Conlan



APPLE-1010 (Conlan), FIGS. 6 (top), 2 (bottom);
'040 Pet., 18-20; '040 APPLE-1003, ¶¶9-11.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Combination of Allum, Raymond, and Conlan (ARC)

Dr. Kenny's Declaration (APPLE-1003)

67. It would have been obvious to a POSITA to combine the teachings of Allum and Raymond to incorporate Raymond's power supply and RT clock into Allum's measuring device because doing so would have merely involved combining prior art elements according to known methods to yield predictable results, as explained in more detail below.

'040 APPLE-1003, ¶ 67; '040 Pet., 15-18.

70. A POSITA would have also incorporated Raymond's RT clock into Allum's measuring device to initiate data collection sequence and synchronize each data sampling event. APPLE-1009, 10:16-36. For instance, Allum teaches that its device logs the "time

'040 APPLE-1003, ¶ 70; '040 Pet., 15-18.

46. Specifically, Conlan's buttons "allow the subject to indicate the occurrence of a particular event" such as "dizziness," and the occurrence is recorded to the memory of the device. *Id.*

79. A POSITA would have modified Allum+Raymond's device to include Conlan's buttons to direct the device to gather data (e.g., subject's balance or movement) as it relates to a particular event specified by the user input buttons. The labeling or association of movement data with an event would then allow data associated with the event to subsequently be processed or displayed in a particular way. For example, movement data for only the event may be configured to be displayed, stored separately, or provided to the user if the user is only interested in movement data related to the event. The identification of event-specific balance data would allow a clinician to better understand a subject's balance or postural problems (e.g., by contrasting balance data

'040 APPLE-1003, ¶¶ 78-79 ; '040 Pet., 21-22.

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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Integration of Conlan's Teachings Enables ARC to Identify/Capture User-Specified Event Information

Petitioner Reply

entitled to little or no weight."). Indeed, as Allum relates to providing "a diagnostic and a rehabilitory tool for ***subjects who*** are prone to abnormal falling and ***who wish to improve their movement control***," providing an additional means of capturing user-specified event information, particularly those related to user feelings prior to falling (e.g., dizziness, nausea), would be consistent with Allum's goals. APPLE-1008, 3:55-64.

'040 Pet. Rep., 3.

Moreover, LoganTree conflates subjects that are "prone to abnormal falling" with subjects that are not "able to sense or feel instability." POR, 21-22. Subjects that are "prone to abnormal falling" are not necessarily subjects that are not "able to sense or feel instability." Indeed, a subject that begins to sense the occurrence of a particular event," such as "dizziness," is capable of pushing a button to indicate the beginning of an event corresponding to dizziness. APPLE-1010, 6:38-46; APPLE-1003, ¶[78]. LoganTree fails to consider that Allum envisions a

'040 Pet. Rep., 3.

Allum

The present invention provides a method and apparatus for performing non-invasive, sensitive, and reliable tests for the presence of abnormalities in the postural sway of a human subject during standing or movement tasks. A method or device in accordance with the present invention may be used as both a diagnostic and a rehabilitory tool for subjects who are prone to abnormal falling or who wish to improve their movement control. The present invention may

APPLE-1008, 3:55-62; '040 Pet. Rep., 3.

Conlan

Referring to FIG. **5**, the top surface of activity monitor **10** includes a pair of user-input pushbutton switches **22** and **23**. These switches, which are preferably membrane type switches, allow the subject to indicate the occurrence of a particular event. For example, upon the occurrence of dizziness or pain, the subject may be instructed to depress one of the push button switches to cause that occurrence to be recorded in the internal memory of the monitor. To enable

APPLE-1010, 6:38-46; '040 Pet. Rep., 3.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Patent Owner's Arguments are Uncorroborated

Petitioner Reply

dizziness) to the device via manual buttons. LoganTree nor its expert provides any support for asserting that Allum's "design scheme and stated purpose" cannot incorporate user buttons. Thus, LoganTree's arguments or its expert's statements should be entitled to little or no weight. 37 C.F.R. §42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."). Indeed, as Allum relates to providing "a

'040 Pet. Rep., 3.

Patent Owner Response

6:38-46. As Dr. Madisetti explains, Allum does not teach or suggest to a POSITA that it should be modified to include Conlan's pushbuttons for user input because the design scheme of Allum neither requires, nor provides a means for, user input about his or her own stability condition. *See* EX2001 at ¶48.

'040 POR, 21.

Madisetti Declaration

48. Allum does not teach or suggest to a POSITA that it should be modified to include Conlan's pushbuttons for user input because the design scheme of Allum neither requires, nor provides a means for, user input about his or her own stability condition.

49. A POSITA would have read Allum to suggest that a designer should refrain from including user inputs for at least two reasons. First, the patients who would use the Allum device are inherently "prone to abnormal falling" as Allum suggests, and likely may not be able to sense or feel instability, as would be required to provide input via the Conlan pushbuttons.

'040 EX2005, ¶¶ 48-49.

Does not disclose underlying facts or data (to the extent any such facts or data exist)

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

’040 Issue 2

Allum-Raymond-Conland Renders Obvious “time stamp information” [1d-3]

’040 [1d-3] / ’037 [1f]: “storing first event information related to the detected first user-defined event along with ***first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred***;”

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Allum Itself Discloses Storing Time Stamp Information

Allum

The number of times that a feedback system issues a warning signal to the subject that his upper body is approaching his cone of stability may be saved in the processor system memory 16, along with the circumstances involved (e.g., time of day, preceding pitch and roll velocities, etc.). This recorded data may be retrieved by an

APPLE-1008, 14:47-52.

Dr. Kenny's Declaration

first user-defined event"). APPLE-1008, 15:48-53. Allum explains that the system processor 14 "***save[s] in the processor system memory***" the "circumstances" of the fall warning, including the "time of day" ("***along with first time stamp information***"). *Id.*, 14:47-52. A POSITA would have understood that the "circumstances" of the fall warning would have included movement data that caused the fall warning to occur such as indication of the body's movement that led to the fall warning being issued. And to the extent Patent Owner argues that

'040 APPLE-1003, ¶ 120; '040 Pet., 32-33.

Allum Itself Discloses Storing Time Stamp Information

Allum

A time history of the subject's angular sway deviations **46** and angular sway velocity **48** in the roll and pitch directions, over a selected examination trial period, is provided in the center of the insert displays **42** and **44**, respectively. The displacement in a horizontal direction of an individual point in the time history displays **46** and **48** from the center of the insert displays **42** and **44** represents degrees of roll or degrees per second of roll, respectively. Degrees of pitch and

APPLE-1008, 10:10-17.

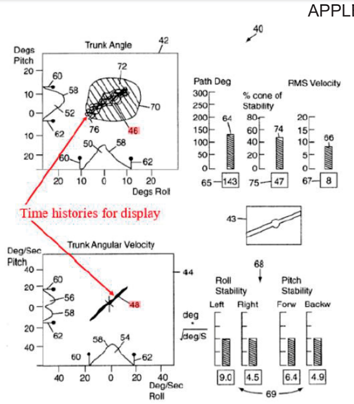


Fig. 3

APPLE-1008, FIG. 3.

Petitioner Reply

One example of the time-histories of movement data is shown below in Allum's FIG. 3. Pet., 10, 17-18, 32-33. Allum explains that ***"[a] time history of the subject's angular sway deviations 46 and angular sway velocity 48 in the roll and pitch directions, over a selected examination trial period,*** is provided in the center of the insert displays 42 and 44, respectively. The displacement in a horizontal direction of an individual point in the time history displays 46 and 48 from the center of the insert displays 42 and 44 represents degrees of roll or degrees per second of roll, respectively." APPLE-1008, 10:10-17. Display 40 "is preferably updated at a rate of at least four times per second during the examination trial, which may typically last 10-30 seconds." *Id.*, 10:50-53.

'040 Pet. Rep., 8-10.

Allum's Time Stamp Information is not Logged data

Allum

operator on an operator's display unit. Quantified body sway information that may be provided to the operator as part of the operator's display includes: time histories of the subject's angular sway deviations and angular velocity in the roll and pitch directions, histograms of the sway deviations and sway velocities over an examination trial period for the roll and pitch directions, a measurement of the total vectorial angular path transversed by the subject's upper body during the examination trial period, and measures of maximum instability in the roll and pitch directions. The operator's

APPLE-1008, 4:23-32.

Petitioner Reply

The quantified body sway information that is provided for display "includes: ***time histories of the subject's angular sway deviations and angular velocity*** in the roll and pitch directions, … ***a measurement of the total vectorial angular path transversed by the subject's upper body during the examination trial period …*** ." APPLE-1008, 4:23-32.

'040 Pet. Rep., 7.

1003, ¶[120]. Indeed, the time history information displayed in FIG. 3 would not make sense if it corresponded to the time at which the fall warning is logged, as LoganTree contends.[2] Accordingly, the "circumstances" data that is stored along

'040 Pet. Rep., 11.

Raymond's Real-Time Clock ("RT clock") would have Provided Data Synchronization and Sequencing in Allum's system

Raymond

Although the periodicity of the wakeup pulses (and therefore the sampling rate of the system) is rigidly controlled by the crystal-based oscillator of the RT clock 155, the CPU clock (which must be much faster than the 2.5 KHz rate of the RT clock 155) is controlled by the RC pair 157. This RC clock is not a precision clock, but provides an oscillation rate of approximately 4 MHz. This comparatively fast clock speed allows the CPU 141 to process all of the instructions necessary to accomplish the desired data transfer tasks involved in signaling the ADC 146, receiving data from the ADC 146 and transmitting the data to the MS controller 150.

…

accurate clock. Because the RT clock 155 synchronizes each data sampling event by initiating the data collection sequence with a wakeup pulse, the maximum sampling rate is a stable 2.5 KHz.

APPLE-1009, 10:16-36.

Dr. Kenny's Declaration

subject's movement. APPLE-1008, 14:47-54, 10:10-13. A POSITA would have understood that data such as "time of day" data would have been provided by a real time clock. However, Allum does not explicitly teach that its device includes a clock. It would have been obvious to a POSITA to incorporate a RT clock in Allum's device so that Allum's device can use a clock for logging time information and so that it can "synchronize[ ] each data sampling event by initiating the data collection sequence," as taught by Raymond. APPLE-1009, 10:16-36. A POSITA would have certainly understood that Allum's determination of Time of Day could have been accomplished by use of a RT clock, such as described by Raymond. When incorporated into Allum's device, Raymond's RT clock 155 would have provided a wakeup pulse signal to initiate data collection sequencing and synchronization of data sampling events. APPLE-1009, 10:16-36. In addition, a real-time time value would have been obtained from the RT clock to record a particular time-stamp value. As evidenced by Farber, a time-stamp

'040 APPLE-1003, ¶¶ 70, 120; '040 Pet., 32-33, 15-18.

FISH.

Raymond also Discloses Storing Time Stamp Information

Raymond

the like. As the data is collected, it is time stamped, compressed (where appropriate) and uploaded to the database, labeled for the patient in question. The resulting health history is a combined format of objective physical parameters and subjective patient data which is time-indexed for subsequent retrieval and analysis. From these stored datastreams, trends in the data may be identified.

APPLE-1009, 2:23-30.

Dr. Kenny's Declaration

APPLE-1008, 10:10-13, 11:26-50, 17:1-5; APPLE-1009, 1:58-67, 2:17-30. Raymond teaches that "[a]s the data is collected, it is time stamped, compressed (where appropriate) and uploaded to the database, labeled for the patient in question. The resulting health history is a combined format of objective physical parameters and subjective patient data which is time-indexed for subsequent retrieval and analysis." APPLE-1009, 2:23-30. In support of Allum's "time history" of the subject's movement, a POSITA would have incorporated the time-stamping of collected data and stored it in a memory, such as Allum's memory 16, so that the subject's health can be tracked and assessed "over days, months, and years." APPLE-1009, 1:42-57; APPLE-1008, 14:47-54, 10:10-13; APPLE-1003, ¶[71]. A POSITA would have found it predictable to

'040 APPLE-1003, ¶¶ 71, 120; '040 Pet., 18.

’040 Issue 3

ARC Renders Obvious
“interpreting… movement data” [20c]

[20c]: “***interpreting,*** using a microprocessor included in the portable, self-contained movement measuring device, ***said physical movement data based on user-defined operational parameters and a real-time clock***;”

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Allum Interprets Movement Data Based on User-Defined Operational Parameters

Allum

Signals from the body sway sensors on the subject are provided to a microprocessor based system processor. The system processor is programmed to transform the angular position and velocity information provided by the sensors into useful information formats that are displayed to an operator on an operator's display unit. Quantified body sway

APPLE-1008, 4:18-23; *see also* 7:21-27.

to indicate to the subject that he is in danger of falling. The sensitivity of the movements of the central bar **100** with respect to angular sway deviations, the sensitivity of the width of the central bar **100** with respect to the angular velocity of the subject's upper body, as well as the proximity to the cone of stability which the subject's upper body deviation angle must approach before the center **108** of the bar **100** flashes a warning, are preferably all variable parameters. These variable parameters represent the visual feedback gain of the system. The visual feedback gain parameters may be set by the operator to help improve the subject's control of sway, and therefore improve the subject's balance control for one or more movement tasks. The visual feedback gain parameters may be fine tuned by repeated movement task examination trials employing the diagnostic information features provided in the operator display **40**.

APPLE-1008, 13:16-42.

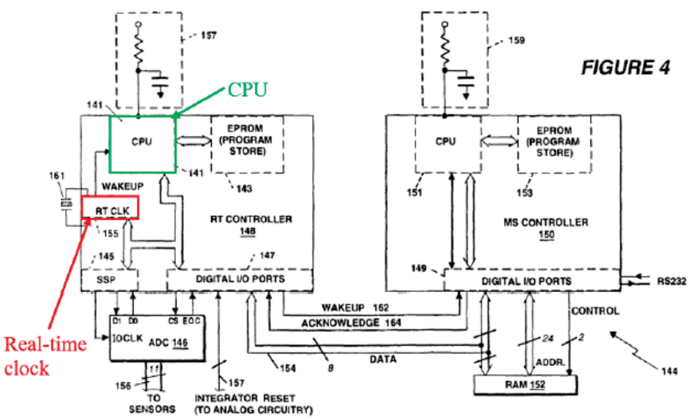
Dr. Kenny's Declaration

115. Allum teaches that the "system processor is programmed to ***transform*** the angular position and velocity information provided by the sensors into useful information formats" ("***receiving [and] interpreting … movement data***"). APPLE-1008, 4:18-23, 7:21-25, Abstract. For example, based on the information received from the sensors, processor 14 determines whether to` issue a "warning signal to the subject that his upper body is approaching his cone of stability"—*i.e.*, "that he is in danger of falling." *Id.*, 13:12-16, 14:47-49. This interpretation of the sensor data is based on "variable parameters" ("***user-defined operational parameters***") "set by the operator" including the subject's "cone of stability" and "the proximity to the cone of stability" that triggers a warning. *Id.*, 13:16-32, 15:20-31, 13:52-62.

'040 APPLE-1003, ¶ 115; '040 Pet., 29.

Raymond Discloses "interpreting" Based on a Real-Time Clock

Raymond



APPLE-1009, FIG. 4.

Dr. Kenny's '040 Declaration

126. The RT clock 155 runs continuously and "includes a timer which every thirteenth oscillation [that] provides a 'wakeup' pulse to CPU 141." APPLE-1009, 10:1-15. The wakeup pulse is used to initiate data collection sequence and synchronize each data sampling event. APPLE-1009, 10:16-36.

127. It would have been obvious to a POSITA that, in ARC, the RT clock 155 would similarly be connected to Allum's microprocessor so that the microprocessor can use the time information provided by RT clock 155 to perform time synchronization and support time-stamping of collected data. *See supra* Section VI.C.

'040 APPLE-1003, ¶¶ 126-127; '040 Pet., 48, 16-18.

Raymond Discloses “interpreting” Based on a Real-Time Clock

Raymond

Although the periodicity of the wakeup pulses (and therefore the sampling rate of the system) is rigidly controlled by the crystal-based oscillator of the RT clock 155, the CPU clock (which must be much faster than the 2.5 KHz rate of the RT clock 155) is controlled by the RC pair 157. This RC clock is not a precision clock, but provides an oscillation rate of approximately 4 MHz. This comparatively fast clock speed allows the CPU 141 to process all of the instructions necessary to accomplish the desired data transfer tasks involved in signaling the ADC 146, receiving data from the ADC 146 and transmitting the data to the MS controller 150.

…

accurate clock. Because the RT clock 155 synchronizes each data sampling event by initiating the data collection sequence with a wakeup pulse, the maximum sampling rate is a stable 2.5 KHz.

APPLE-1009, 10:16-36.

Dr. Kenny’s Declaration

148. To the extent that Patent Owner argues that Allum does not teach a RT clock, the Allum-Raymond device includes Raymond’s RT clock, as explained above in Section VI.C. The RT clock would have been connected to Allum’s microprocessor so that the microprocessor can use the time information provided by RT clock to perform time synchronization and time-stamp collected sensor data. Accordingly, in addition to the interpretation of the data based on user-defined operational parameters, the data is interpreted based on timing information provided by the real-time clock.

’040 APPLE-1003, ¶¶ 148, 70-71; ’040 Pet., 48, 16-18.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Allum's "interpreting" Aligns with that Described in the '576 Patent

Allum

The number of times that a feedback system issues a warning signal to the subject that his upper body is approaching his cone of stability may be saved in the processor system memory **16**, along with the circumstances involved (e.g., time of day, preceding pitch and roll velocities, etc.). This recorded data may be retrieved by an operator or transmitted, via wireless communications, to a central monitoring station. Further, a fall warning may be

APPLE-1008, 14:47-54.

'576 Patent

responds to the data. If a recordable event occurs, the microprocessor **32** retrieves the date/time stamp from the clock **46** and records the event information along with the date/time stamp in memory **50**. In a preferred embodiment,

APPLE-1001, 5:44-47.

Dr. Kenny's Declaration

147. Allum also teaches that, as part of the interpretation of the body sway data, its device logs the "time of day" a "warning" is provided to the subject. APPLE-1008, 14:47-54. A POSITA would have understood that the interpretation of this movement data is done based on time provided by a RT clock. In fact, Allum uses the time of day for interpretation in a similar manner as the '576 Patent, which records a "date/time stamp" "if a recordable event occurs." APPLE-1001, 5:44-47.

148. To the extent that Patent Owner argues that Allum does not teach a RT

'040 APPLE-1003, ¶ 147; '040 Pet., 48.

Allum Discloses the "Analysis" of Movement Data

Allum

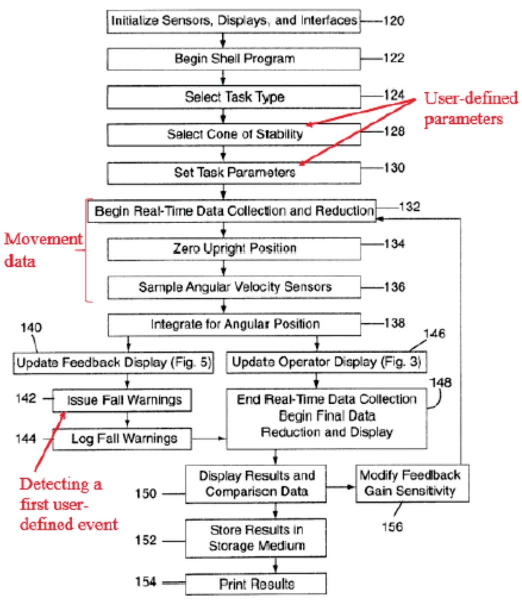


Fig.6

APPLE-1008, FIG. 6.

Petitioner Reply

As shown below in Allum's FIG. 6, after collecting and sampling real-time data from sensors 12, the body sway angle and angular velocity can be displayed to the user and an operator through displays and "a fall warning is provided when the subject's trunk sway is within one degree of the cone of stability" (steps 132-146) APPLE-1008, 15:24-50, FIGS. 3, 5; Pet., 32. The fall warnings are logged for later retrieval at step 144. APPLE-1008, 15:50-55. Allum discloses that "[t]he number of times that a feedback ***system issues a warning signal*** to the subject that his

'040 Pet. Rep, 6.

¶[115]. To the extent an "analysis" of the movement data is required (as LoganTree contends and Apple does not concede), Allum *analyzes* the movement data by comparing the sensor data against the user-defined subject's "cone of stability" and "proximity to the cone of stability" to determine whether to trigger a warning, as explained above.

'040 Pet. Rep, 16.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Allum Discloses the "Analysis" of Movement Data

Allum

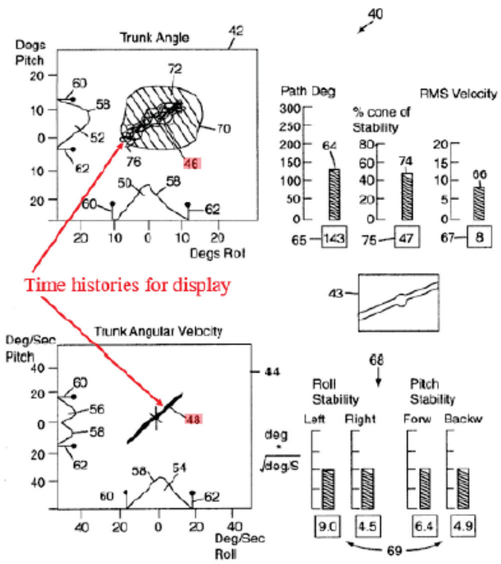


Fig. 3

APPLE-1008, FIG. 3.

Petitioner Reply

circumstances around a fall warning. For example, Allum's system can determine and store data indicating that an event occurred at a certain time by interpreting physical movement data based on the time of day information, and store this information in memory 16 as part of the circumstances around a fall warning. In addition, the physical movement data obtained from Allum's sensors can be interpreted (e.g., translated to a display format) based on the time of day information so that the time history of movement data can be displayed, e.g., as shown in Allum's FIG. 3 (reproduced below).

'040 Pet. Rep, 17.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

’037 Issue 1

A POSITA Would have been Motivated to
Combine Ono and Hutchings

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Ono

United States Patent [19]

Ono et al.

[54] **EXERCISE MEASURING INSTRUMENT**

[75] Inventors: **Haruo Ono; Satoshi Kinoshita; Fusao Suga,** all of Tokyo, Japan

[73] Assignee: **Casio Computer Co., Ltd.,** Tokyo, Japan

[21] Appl. No.: **339,179**

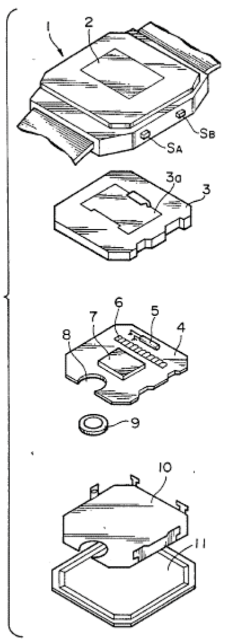
[22] Filed: **Apr. 14, 1989**

APPLE-1101, Cover Page.

FIG. **1** is an exploded perspective view of an electronic wrist watch to which a pedometer is installed. A

APPLE-1101, 3:10-11.

FIG. 1



In FIG. **8,** an acceleration sensor **40** is the same as the sensor shown in FIGS. **2** and **3** and is installed in the wrist watch in the same manner as in FIG. **1.** The output signal of the acceleration sensor **40** is applied to a waveform-shaping section **47** and the waveform-shaping section **47** shapes the output signal of the acceleration sensor **40** into a pulse signal having a square waveform. The pulse signal outputted from the waveform-shaping section **47** is counted by a counter **48** and the count data is supplied to a control section **49.** The control section **49** comprises a CPU which reads out from a ROM **50** a micro-programme stored in the ROM **50** to operate the present system when the operator inputs a system-start signal to the control section **49** by operating a key-input section **51** and executes processes in accordance with the micro-programme. The control section **49** calculates the number of steps on the basis of the count data delivered from the counter **48** and further calculates the number of steps or a distance-walked on the basis of the count data of the counter **48** and stride-length data previously stored in a RAM **52** through the control section **49** from the key-input section **51.** Then the control section **49** sends the calculated

APPLE-1101, 8:59-9:12.

FISH.

’037 Pet., 18-22, 28-30; ’037 Pet. Rep, 4

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Hutchings

United States Patent [19]
Hutchings

[54] **SYSTEM AND METHOD FOR MEASURING MOVEMENT OF OBJECTS**

[75] Inventor: **Lawrence J. Hutchings**, Castro Valley, Calif.

[73] Assignee: **Acceleron Technologies, LLC**, Oakland, Calif.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/877,342**

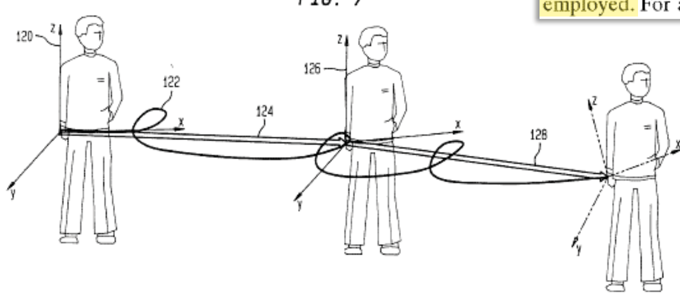
[22] Filed: **Jun. 17, 1997**

APPLE-1102, Cover Page.

As mentioned above, in accordance with other embodiments of the invention, measuring system **10** can be located on parts of the body other than the foot of the user and still achieve the same accuracy in measuring the speed, distance traveled, and the height jumped. For example as discussed above, the measuring system may be employed at the wrist or the waist of the user as discussed hereinafter. FIG. **7** is a plot illustrating an embodiment of the invention employed on the wrist of the user.

APPLE-1102, 10:43-51.

FIG. 7



In accordance with one aspect of the invention, a device for measuring the performance of a runner utilizes accelerometers and rotational sensors to measure the speed, distance traveled, and height jumped of a person. It may be

APPLE-1102, 3:5-8.

displacement is used to determine the height jumped. One set of three-component linear accelerometers and one set of three-component rotational sensors may be employed to resolve the absolute motion of a person from the motion of the foot.

APPLE-1102, 3:22-26.

In accordance with another embodiment of the invention, instead of accelerometers velocity sensors may be employed. For a measuring system that employs a velocity

APPLE-1102, 12:58-60.

FISH.

'037 Pet., 22-24, 28-30; '037 Pet. Rep., 4-8.

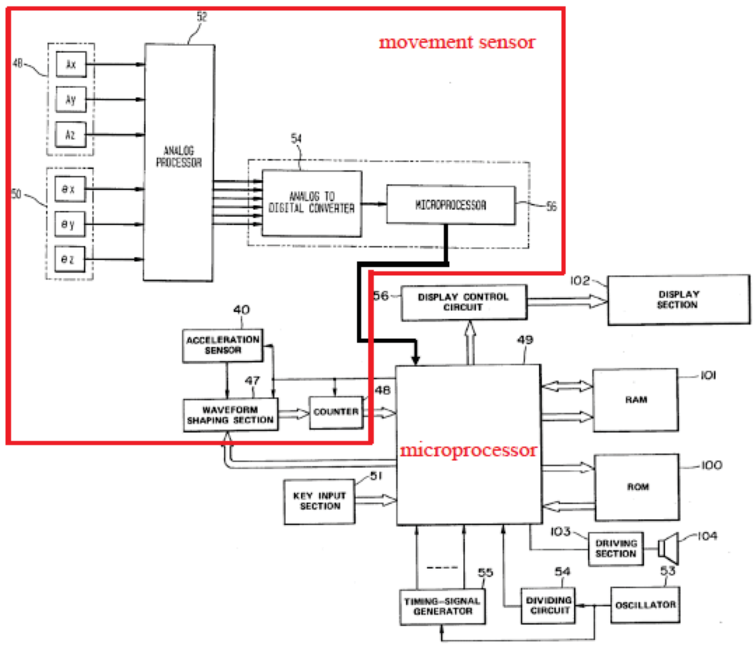
DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

The Ono-Hutchings Combination

Dr. Kenny's Declaration

62. A POSITA would have been motivated and would have found it obvious to implement Ono's device with a measuring system that includes accelerometers to measure accelerations in three dimensions, and rotational sensors to provide the angle of rotation along each axis of the translational coordinate, and a microprocessor to calculate distance traveled during each cycle, as suggested by Hutchings. APPLE-1102, 4:21-32, 4:55-65, 5:3-16, 8:44-9:17, 9:48-12:37, FIGS. 6-7.

APPLE-1100, ¶62.



APPLE-1100, ¶71.

'037 Pet., 24-26, 28-30; '037 Pet. Rep., 3-8.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

A POSITA would have Implemented Ono's Device with Multidimensional Accelerometers and Rotational Sensors as Suggested by Hutchings

Ono

FIG. 1 is an exploded perspective view of an electronic wrist watch to which a pedometer is installed. A

APPLE-1101, 3:10-11.

accordance with the micro-programme. The control section 49 calculates the number of steps on the basis of the count data delivered from the counter 48 and further calculates the number of steps or a distance-walked on the basis of the count data of the counter 48 and stride-length data previously stored in a RAM 52 through the control section 49 from the key-input section 51. Then the control section 49 sends the calculated

APPLE-1101, 9:5-12.

is incremented at Step c_{27}. That is, in the data-setting mode (M=-4), the switch S3 is a switch which serves to decide which one of the stride-lengths of the exercise modes such as exercise walking and jogging is to be set, and one of stride-lengths of three exercise-modes can be set by operation of the switch S3.

APPLE-1101, 18:28-33.

Hutchings

There are other running aids known in the prior art such as pedometers as disclosed in U.S. Pat. No. 4,053,755 to Sherrill. These devices usually count the number of steps taken and for a particular stride length, the approximate distance traversed can be determined.

APPLE-1102, 1:60-64.

It is, therefore, a difficult task to determine the correct stride length for an individual runner at various speeds. Thus, pacing timers can provide no more than a constant running pace, and pedometer measurements are only useful as an approximation of distance traversed. Also, ultra sound

APPLE-1102, 2:27-31.

With the foregoing in mind, the ideal running aid should, therefore: be light in weight; serve a number of useful functions; be inexpensive; provide measurements that are readily available to the user; be reliable and easy to use; and provide accurate measurements of speed, distance traversed, height jumped, and other useful information.

APPLE-1102, 2:40-46, 2:66-3:2.

A specific objective of this invention is to provide a new and improved running and walking measuring system, in which the speed of the runner can be easily and accurately determined.

A further specific objective of this invention is to provide a new and improved running and walking measuring system, in which the distance traversed by the runner can be easily and accurately determined.

APPLE-1102, 2:54-61.

Dr. Kenny's Declaration

63. In pursuing specific design options for such a device, the POSITA would have explored prior art references like Hutchings that describe movement measuring devices that are also worn on the user's wrist and are expressly directed to improving pedometer devices like Ono's that "count the number of steps taken and for a particular stride length, the approximate distance traversed can be determined." APPLE-1102, 1:60-64, 3:32-44, 4:7-26, 10:43-51, FIGS. 7-9;

1102, 2:15-31. The POSITA would have been motivated to use Hutchings' measuring system to leverage the stated benefits of providing "accurate measurements" of speed and distance traversed without manually setting stride lengths for different exercise modes. APPLE-1102, 2:45-61; APPLE-1101, 13:40-42, 18:28-19:6.

APPLE-1100, ¶63.

FISH.

'037 Pet., 18-26, 28-30; '037 Pet. Rep., 3-8.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

A POSITA would have Implemented Ono's Device with Multidimensional Accelerometers and Rotational Sensors as Suggested by Hutchings

Ono and Hutchings

FIG. **1** is an exploded perspective view of an electronic wrist watch to which a pedometer is installed. A watch glass **2** is provided on an upper surface of a wrist watch casing **1**, and a mode-selecting switch S_4 and a

APPLE-1101, 3:10-13.

sponding to a display mode. In this mode register. M=0 is set when a time-display mode is selected, M=1 is set when a step-counting mode is selected, M=2 is set when a display-mode is selected for displaying number of steps, a distance-walked, a mean speed, calorie consumption, M=3 is set when a display-mode is selected for displaying various data of each date and M=4 is set when a data-setting mode is selected for setting stride-lengths, calorie consumption as a target, respectively.

APPLE-1101, 13:34-42.

reference to FIG. **6**. Mode select unit **66** is employed at the start of the run or jog by depressing an appropriate switch,

APPLE-1102, 9:49-50.

Dr. Kenny's Declaration

64. The POSITA would have also been motivated to use Hutchings' measuring system for the benefit of providing the user with different options for obtaining measurements of speed and distance based on the user's desire in accuracy and battery conservation. *Id.* Hutchings describes a mode select switch that a user depresses to use Hutchings' measuring system to calculate speed and distance. APPLE-1102, 9:48-10:18. A POSITA would have found obvious to turn off Hutchings' measuring system to conserve battery when Hutchings' measuring system is not being used. *See, e.g.*, APPLE-1106, 8:12-18; APPLE-1014, 7:40-44, 9:46-49, 16:10-15; APPLE-1010, 4:20-25. The user is advantageously provided the option to select between accurate distance/speed/velocity measurements using Hutchings' measuring system at the expense of higher battery consumption or less accurate distance/speed/velocity measurements using Ono's calculations for the benefit of lower battery consumption. *Id.*

APPLE-1100, ¶64.

Corroborating Evidence

450 from the external device. Accelerometer battery power supply **420** may be responsive to control signal **450**, deactivating power output to the external accelerometer in the absence of control signal **450**, thus offering the capability to minimize power consumption during non-measurement periods and extending battery life or time between recharges.

APPLE-1106, 8:12-18.

period. Also, the microprocessor **18** controls the on/off state of the gyroscope **16** to only hold the gyroscope on during the period in which the learning and assessment aid is actually being used to monitor movement. Collectively, these features minimize the power drawn by the battery **72** so as increase the useful lifetime of the battery.

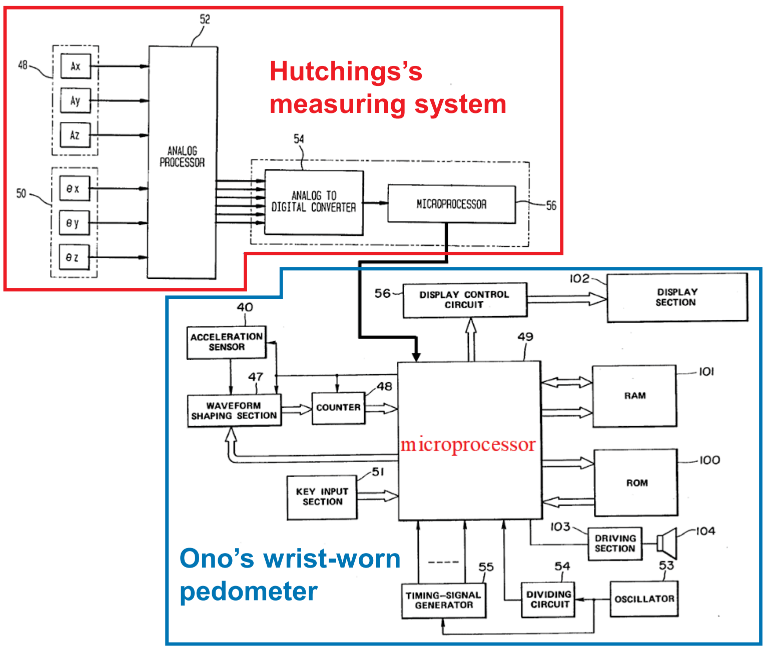
APPLE-1014, 16:10-15.

tion of the various circuits of the monitor are controlled. The microprocessor is preferably capable of powering up and shutting down the processing circuits at selected times to conserve battery power.

APPLE-1010, 4:22-25.

Ono-Hutchings is the Predictable Result of Combining Known Elements

Ono-Hutchings



APPLE-1100, ¶62.

Dr. Kenny's Declaration

65. Moreover, a POSITA would have viewed the implementation of Ono's device in a manner that applied Hutchings' suggested measuring system as merely the predictable result (e.g., a pedometer that includes accelerometers to measure accelerations in three dimensions, rotational sensors to provide the angle of rotation along each axis of the translational coordinate, and microprocessors to calculate the speed and distance traveled during each cycle) of combining known prior elements according to known methods. The POSITA would have appreciated that the Ono-Hutchings combination does not change the hallmark aspects of either of these references, and any modifications needed to incorporate Hutchings' teachings into Ono's device to provide the above benefits would have been predictable with a foreseeable chance of success and within the skill of a POSITA. The respective teachings would work together in combination just as they did apart, with Hutchings' suggestion merely improving/adding to Ono's device.

APPLE-1100, ¶65.

'037 Pet., 24-26, 28-30; '037 Pet. Rep., 3-8.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Patent Owner's Uncorroborated Expert Testimony does not Undermine Ono-Hutchings

Patent Owner Response and Sur-Reply

Paper 3, Petition at 26. But as Dr. Madisetti explains, *Ono* and *Hutchings* have fundamentally different (and incompatible) architectures. *See* EX2001 at ¶61. *Ono* uses a simpler (and lower-

'037 POR, 19-20.

physically combined together." Paper 21 at 6. This is a strawman. LoganTree's argument was never physical incompatibility, but rather logical/architectural/system design incompatibility.

'037 PO Sur-reply, 3.

at 20. Combining Ono with Hutchings's sensors would not work unless Ono were given a complete, ground-up redesign—something that makes sense only in the context of litigation-driven

'037 PO Sur-reply, 3.

Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC, 825 F.3d 1373, 1380-1381 (Fed. Cir. 2016)

Contrary to Allied's position, "it is not necessary that [Caterpillar and Ogawa] be physically combinable to render obvious the ['489 patent]." In re Sneed, 710 F.2d 1544, 1550 (Fed. Cir. 1983); *see also* In re Etter, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc) ("Etter's assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole."). "The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference," In re Keller, 642 F.2d 413, 425 (CCPA 1981). *See also* In re Mouttet, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (citing In re Keller, 642 F.2d at 425), but rather whether "a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention," Pfizer, Inc. v. Apotex, Inc., 480 F.3d 1348, 1361 (Fed. Cir. 2007).

'037 Pet. Rep., 6.

FISH.

Patent Owner's Uncorroborated Expert Testimony does not Undermine Ono-Hutchings

Patent Owner Response

POSITA would understand that doing so would significantly increase the complexity and cost of the device while also having a dramatic negative impact on battery life—unacceptable trade-offs

'037 POR, 19.

changing the sensor architecture, and Petitioner fails to explain how either of these would motivate a POSITA to modify *Ono* with a significantly more complex set of sensors that would require more processing power and memory while draining the batteries much faster. Paper 3, Petition at

'037 POR, 19.

***Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1380-1381 (Fed. Cir. 2016)**

Upon determining that side walls 13a of Caterpillar serve a similar quick release function as the bridge housing of the '489 patent, it would have been obvious to a person of ordinary skill in the art to modify the immobilized jaw of Caterpillar (first jaw 13) in order to provide for a wider range of motion as taught by Ogawa, to make the jaw set more efficient. For example, a wider range of motion would augment the jaw sets' grasping capabilities. *See* J.A. 66 (asserting a skilled artisan would seek to modify the jaws of Caterpillar in order to provide a "wide range of angular movement"); *see also* J.A. 23 (referring to the "desirability of allowing for wide openings" (citation omitted)). Although modification of the movable blades may impede the quick change functionality disclosed by Caterpillar, "[a] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine." *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (citation omitted). As articulated by the

'037 Pet. Rep., 6.

FISH.

Patent Owner's Uncorroborated Expert Testimony does not Undermine Ono-Hutchings

Patent Owner Sur-Reply

Regarding "teaching away": Even if a POSITA would have had a motivation to combine Ono with Hutchings, and even if a POSITA would have had a reasonable expectation of success, they would not have done so because the prior art and a POSITA's knowledge teach away from this combination. As LoganTree pointed out in its Response (Paper 17 at 19), integrating Hutchings's complex sensors would have a dramatic negative impact on battery life on the Ono device (among other problems). Petitioner's Reply to this (Paper 21 at 5–6) is confused, and

'037 PO Sur-reply, 4.

Depuy Spine, Inc. v. Medtronic Sofamor Danek, Inc., 567 F.3d 1314, 1327 (Fed. Cir. 2009)

"A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *Ricoh Co., Ltd. v. Quanta Computer Inc.*, 550 F.3d 1325, 1332 (Fed.Cir.2008) (quoting *In re Kahn*, 441 F.3d 977, 990 (Fed.Cir.2006)). A reference does not teach away, however, if it merely expresses a general preference for an alternative invention but does not "criticize, discredit, or otherwise discourage" investigation into the invention claimed. *In re Fulton*, 391 F.3d 1195, 1201 (Fed.Cir. 2004). In this case, we agree with the district court that Puno does not merely

'037 Pet. Rep., 6.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Ono-Hutchings Enhances Ono

Ono

[22] Filed: Apr. 14, 1989

APPLE-1101, Cover Page.

In pedometers described in the above U.S. Pat. Specifications, a magnetic sensor or a mechanical sensor is used as a sensor detecting walking or jogging. This results in a relative complexity in the sensor-construction and thereby the devices are made not only large in size but also are easy to be damaged by an external shock and the like.

APPLE-1101, 1:11-23.

The present invention constructed as mentioned above, allows to firmly measure exercise in walking, jogging and the like with an extremely simple construction and has a merit that the instrument according to the invention can be made compact in size.

APPLE-1101, 2:22-26.

FIG. 1 is an exploded perspective view of an electronic wrist watch to which a pedometer is installed. A

APPLE-1101, 3:10-11.

Hutchings

[22] Filed: Jun. 17, 1997

APPLE-1102, Cover Page.

With the foregoing in mind, the ideal running aid should, therefore: be light in weight; serve a number of useful functions; be inexpensive; provide measurements that are readily available to the user; be reliable and easy to use; and provide accurate measurements of speed, distance traversed, height jumped, and other useful information.

APPLE-1102, 2:40-46.

A still further objective of this invention is to provide a new and improved running and walking measuring system having the above advantages which is light in weight, relatively inexpensive and convenient to use.

APPLE-1102, 2:66-3:2.

traveled, and the height jumped. For example as discussed above, the measuring system may be employed at the wrist or the waist of the user as discussed hereinafter. FIG. 7 is a plot illustrating an embodiment of the invention employed on the wrist of the user.

APPLE-1102, 10:43-51.

’037 Issue 2

Ono-Hutchings Renders Obvious “storing first event information” “along with first time stamp information” [1f], [20f]

’040 [1d-3] / ’037 [1f]: “storing first event information ***related to*** the detected first user-defined event along with first time stamp information ***reflecting a time*** at which the movement data causing the first user-defined event occurred;”

[20f]: “storing, in said memory, first event information ***related to*** the detected first user-defined event along with first time stamp information ***reflecting a time*** at which the movement data causing the first user-defined event occurred.”

FISH.

Ono-Hutchings Renders Obvious “storing first event information”

Petition provides two independent, alternative mappings

1. Ono’s microprocessor stores in RAM the user-defined operational parameters and the movement data used to detect the user-defined event, both of which are event information related to the detected user-defined event.

2. When the user stops the step-counting mode after Ono’s microprocessor detects a user-defined event, the microprocessor stores in RAM at least the total step count, total distance-walked, and calorie-consumption, which are event information related to the detected user-defined event.

’037 Pet., 47-57; ’037 Pet. Rep., 9-13; APPLE-1100, ¶¶91-98.

2A: Ono-Hutchings Stores User-Defined Operational Parameters used to Detect, and thus Related to, the Detected User-Defined Event

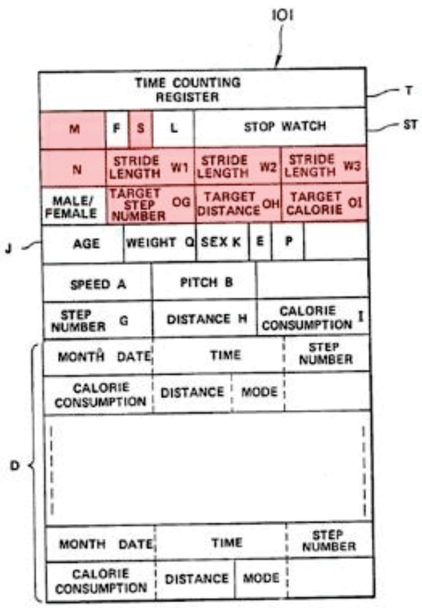


FIG. 15

Ono

Stride-length registers W1, W2 and W3 are registers for storing stride-lengths set in the walking, exercise-walking or jogging mode, respectively. Registers OG, OH and OI serve to store a target number of steps, a target distance and target calorie consumption. Regis-

APPLE-1101, 13:55-59.

Dr. Kenny's Declaration

91. As previously discussed, the user set modes, stride lengths, target distance, and target number of steps are user-defined operational parameters that affect the operations and calculations performed by the Ono-Hutchings device. *Supra* Ground 1, [1d]; APPLE-1101, 13:44-61, 14:65-16:27. These user-defined operational parameters are stored in registers of RAM as suggested by Ono's FIG. 15. *Id.*

APPLE-1100, ¶91.

FISH.

'037 Pet., 47-57; '037 Pet. Rep., 9-13.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

2A: Ono-Hutchings Stores Movement Data used to Detect, and thus Related to, the Detected User-Defined Event

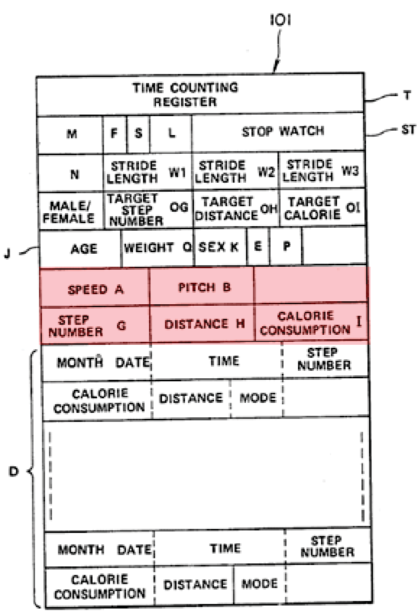


FIG. 15

Ono

> A step-register G, a distance-walked register H and a calorie-consumption register I are for storing accumulative number of steps taken, accumulative distance-walked and accumulative calorie-consumption which are under measurement, respectively.

APPLE-1101, 14:1-5.

Dr. Kenny's Declaration

> APPLE-1102, 9:49-67. In addition, the microprocessor stores movement data (as suggested by Ono's steps a_{11}, a_{12}, a_{16}, a_{19}) related to the detected user-defined event. APPLE-1101, 13:44-45, 14:65-16:27, FIG. 18; APPLE-1102, 10:16-18. Ono's steps a_{11}, a_{12}, a_{16}, a_{19} that store movement data and the steps a_{17}, a_{18}, a_{20}, a_{21} that detect a user-defined event are illustrated in Ono's FIG. 18 below:

APPLE-1100, ¶92.

FISH.

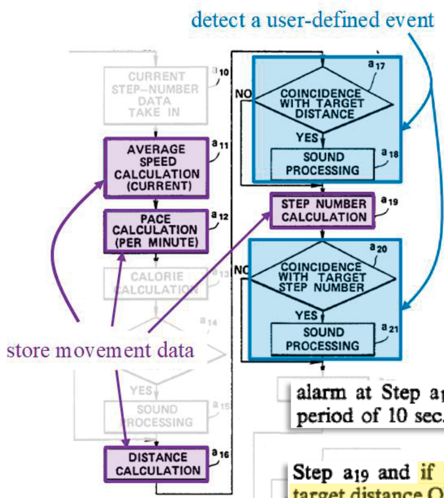
'037 Pet., 47-57; '037 Pet. Rep., 9-13.

37

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

2A: Ono-Hutchings Stores User-Defined Operational Parameters and Movement Data used to Detect, and thus Related to, the Detected User-Defined Event

Ono



alarm at Step a_{15}, distance-walked during every time period of 10 sec. are calculated from the stride length

APPLE-1101, 15:61-62.

Step a_{19} and if the distance-walked has reached the target distance OH, the alarm process is effected at Step a_{18}, generating the alarm sound.

APPLE-1101, 16:2-4.

not, the process advances to Step a_{22} If the above accumulative number of steps has reached the target number of steps OG, the alarm sound is generated at Step a_{21}

APPLE-1101, 16:11-13.

Dr. Kenny's Declaration

Ono suggests storing in RAM the user-defined operational parameters and the movement data used to detect the user-defined event, both of which are related to the detected user-defined event and thus are each event information related to the detected user-defined event. APPLE-1101, 13:44-14:15, 14:65-16:27; *supra* Ground 1, [1e].

APPLE-1100, ¶93.

'037 Pet., 37, 45, 47-57; '037 Pet. Rep., 9-13.

2A: Ono-Hutchings Stores User-Defined Operational Parameters and Movement Data used to Detect, and thus Related to, the Detected User-Defined Event

Patent Owner Sur-reply

at 25–26. Although this information may *later* become "related to the detected first use-defined event" (if it is used to detect the event), at this step the event is not yet "detected" and therefore the stored information as described by Ono could not logically be "related" to any "detected event," and thus the microprocessor is not "storing… information related to the detected… event." Paper 17 at 25 ("In short: Ono does not disclose this limitation because no new or separate "first event information" is stored upon the detection of that user-defined event.")

See Paper 21 at 9. This is illogical. The claim language makes clear that the "first event information" being stored must be "related to" a user-defined event that has been detected (past tense). The disclosures in Ono Petitioner points to discuss storing background parameters used to detect a user-defined event. These citations to Ono do not disclose storing of information related to the already-detected user-defined event.

'037 PO Sur-reply, 7-8.

Petitioner Reply

50, 76-77; APPLE-1100, ¶¶93, 122. The fact that Ono stores the event information used to detect the user-defined event prior to detecting the user-defined event does not make it any less "related to" the detected user-defined event or any less of an indication that the predetermined threshold is met.

'037 Pet. Rep., 10.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

2A: Ono-Hutchings Stores Time Stamp Information

Ono

FIG. 15 is a view showing the construction of the register of RAM 101. RAM 101 is provided with a time-counting register T for storing the present-time data and a mode register M for storing numbers corre-

APPLE-1101, 13:31-33.

above will be described. The system is normally at a halt state of Step a_1 of FIG. 18. When an interruption of time counting is detected, the process advances to Step a_2 to effect a time-counting process in unit of 10 sec or less with respect to the present time. In the time-count-

APPLE-1101, 14:65-15:3.

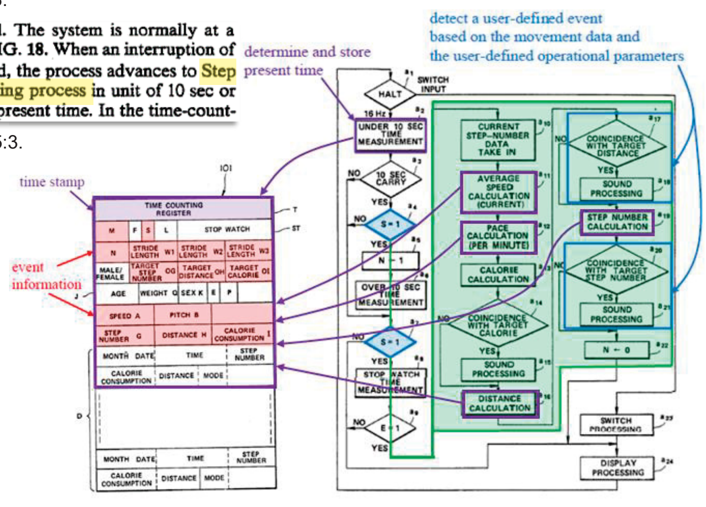


FIG. 15 FIG. 18

Dr. Kenny's Declaration

94. Ono further suggests storing time stamp information in RAM along with the event information: "RAM 101 is provided with a time-counting register T for storing the present-time data" and "a time-counting process is executed to count the present time… and renews the time-counting register in RAM." APPLE-1101, 13:31-33, 12:10-12. With respect to Ono's FIG. 18, Ono describes the time-counting process as step a_2 and the detection of a user-defined event based on the movement data and at least one of these user-defined operational parameters regarding the movement data as steps a_{17}, a_{18}, a_{20}, a_{21} as shown below. APPLE-1101, 15:1-5 ("the process advances to Step a_2 to effect a time-counting process in unit of 10 sec or less with respect to the present time."). Thus, Ono determines and stores the present time data at which the movement data causing the user-defined event occurred. *Infra* Ground 1, claim 30.

APPLE-1100, ¶94.

95. As highlighted in Ono's FIG. 15 below, Ono suggests storing in RAM the event information related to the detected user-defined event along with the present time data at which the movement data causing the user-defined event occurred. APPLE-1101, 13:44-14:15, 14:65-16:27.

APPLE-1100, ¶95.

FISH.

'037 Pet., 47-57; '037 Pet. Rep., 16-21.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

2B: Ono-Hutchings Stores New/Separate Event Information Related to the Already-Detected User-Defined Event

Ono

detect a user-defined event
based on the movement data and
the user-defined operational parameters

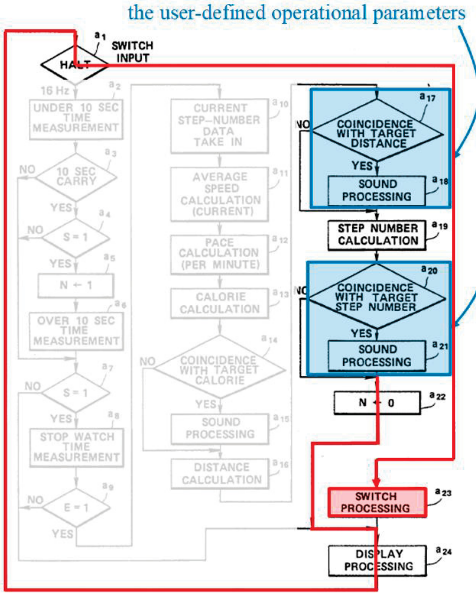


FIG.18

In the meantime, when a switch has been operated at Step a_1, it is discriminated that a switch-interruption has been caused and the process advances to Step a_{23} where a switch-processing is to be executed.

Now, referring to a flow-chart illustrated in FIG. 20 and examples of displays shown in FIGS. 21 to 23, the detail of the above mentioned switch-processing at Step a_{23} will be described hereinafter.

APPLE-1101, 16:28-35.

That is, in the step-counting mode (M=1), the switch S2 functions to start and/or stop the step-counting operation.

APPLE-1101, 17:32-34.

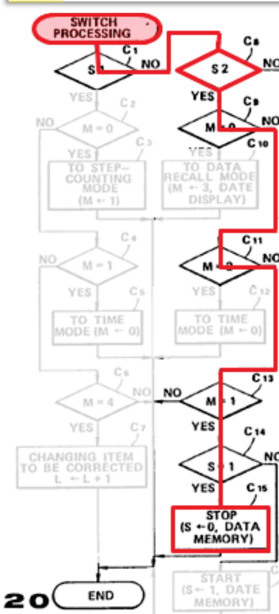


FIG.20

’037 Pet., 47-57; ’037 Pet. Rep., 9-13.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

FISH.

2B: Ono-Hutchings Stores New/Separate Event Information Related to the Already-Detected User-Defined Event

Dr. Kenny's Declaration

96. Ono supports instances where the user stops the step-counting mode operation using switch S_2 after the processor detects that "the distance-walked has reached the target distance OH" and/or that the "accumulated number of steps has reached the target number of steps OG" (user-defined event) and notifies the user by generating the alarm sound, as highlighted by the red path in FIGS. 18 and 20 below. APPLE-1101, 16:28-37, 17:3-59, FIGS. 18, 20.

APPLE-1100, ¶96.

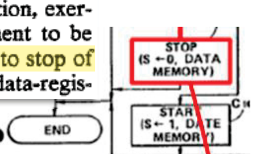
2B: Ono-Hutchings Stores New/Separate Event Information Related to the Already-Detected User-Defined Event

Ono

RAM 101 is further provided with a data register D comprising a plurality of memory areas where counted data of each date such as a time duration of walking, number of steps taken, total calorie-consumption, exercising mode are stored when one measurement to be executed during a time period from the start to stop of the stop-watch counting is terminated. The data-regis-

APPLE-1101, 14:16-22.

FIG. 20



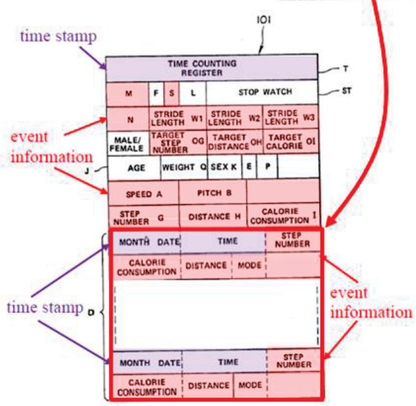


FIG. 15

Dr. Kenny's Declaration

98. Based on Ono's and Hutchings' teachings, a POSITA would have found obvious that, in the instance where the user stops the step-counting or run mode after the microprocessor detects that "the distance-walked has reached the target distance OH" and/or that the "accumulative number of steps has reached the target number of steps OG" (user-defined event) and notifies the user by generating the alarm sound, the microprocessor stores at least the date, duration, total step count, total distance-walked, and calorie-consumption in registers D of RAM 101 for later retrieval and display in the data-recall mode. *Id.* In such instance, the date, duration, total step count, total distance-walked, and calorie-consumption stored in registers D would be related to the detected user-defined event, with the total step count, total distance-walked, and calorie-consumption being the event information related to the detected user-defined event, and the date and duration being time stamp information reflecting a time at which the movement data causing the first user-defined event occurred. *Id.*

APPLE-1100, ¶98.

'037 Pet., 47-57; '037 Pet. Rep., 9-13.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

2B: Ono-Hutchings Stores Time Stamp Information

Ono

RAM 101 is further provided with a data register D comprising a plurality of memory areas where counted data of each date such as a time duration of walking, number of steps taken, total calorie-consumption, exercising mode are stored when one measurement to be executed during a time period from the start to stop of the stop-watch counting is terminated. The data-regis-

APPLE-1101, 14:16-22.

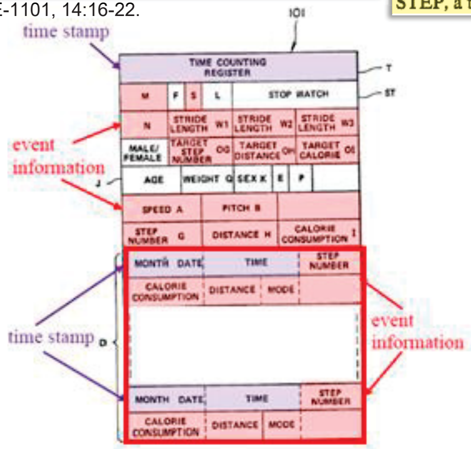


FIG. 15

stored at the data register D. **FIG. 23** is a view illustrating an example of the operation which is executed to display the measured data, "July 3, Sunday" among a plurality of data stored at the data register D. After the mode is switched to the data-recall mode (M=3) and the date is selected, the switch **S4** is operated. Then, a distance-walked 4.50 km, number of steps taken, 6000 STEP, a time period-walked 30 minutes 41 seconds and

APPLE-1101, 20:39-46.

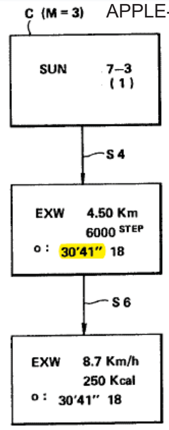


FIG.23

Dr. Kenny's Declaration

98. Based on Ono's and Hutchings' teachings, a POSITA would have found obvious that, in the instance where the user stops the step-counting or run mode after the microprocessor detects that "the distance-walked has reached the target distance OH" and/or that the "accumulative number of steps has reached the target number of steps OG" (user-defined event) and notifies the user by generating the alarm sound, the microprocessor stores at least the date, duration, total step count, total distance-walked, and calorie-consumption in registers D of RAM 101 for later retrieval and display in the data-recall mode. *Id.* In such instance, the date, duration, total step count, total distance-walked, and calorie-consumption stored in registers D would be related to the detected user-defined event, with the total step count, total distance-walked, and calorie-consumption being the event information related to the detected user-defined event, and the date and duration being time stamp information reflecting a time at which the movement data causing the first user-defined event occurred. *Id.*

APPLE-1100, ¶98.

FISH.

'037 Pet., 47-57; '037 Pet. Rep., 16-21.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

2B: Duration is "timestamp information reflecting a time"

Corroborating Evidence

UNITED STATES PATENT OFFICE.

CHARLES AXEL DE CHAPEAUROUGE, OF HAMBURG, GERMANY.

TIME-STAMP.

SPECIFICATION forming part of Letters Patent No. 643,592, dated February 13, 1900.

Application filed August 9, 1899. Serial No. 726,688. (No model.)

To all whom it may concern:

Be it known that I, CHARLES AXEL DE CHAPEAUROUGE, doctor of medicine, a subject of the Emperor of Germany, residing at Rotherbaumchaussee 63, Hamburg, in the Empire of Germany, have invented certain new and useful Improvements in Time-Measuring Apparatus for Race-Courses, of which the following is a full, clear, and exact description.

This invention relates to a time-measure apparatus which is especially suitable for horse-races, and is designed to obtain an exact check regarding the running of the horses. Apparatus as used for this purpose at present, generally in the form of a stop-watch,

and along one side of the top of the box that the center of the strip passes ove numbers of the disk b, which are situat pass near the middle of the front of the The strip h is held in moderate tension weight.

The numbers of the disk b indicate an ister the time which a horse or other o has run in the following manner: The course as seen by the observer is divided equal distances and distance-posts are vided to indicate such distances. Whe horse starts, the person measuring the and conveniently situated at a raised presses on an india-rubber ball k of the

APPLE-1120.

of air (RHatm), average temperature of air (T), simulated altitude (Alt), and time stamp relative to start of test (Time). There are three separate graphs that display volumes of

APPLE-1122, 37.

[57] **ABSTRACT**

In data logging applications an apparatus for real-time stamping data includes a reference time base, a short stopwatch circuit operative for generating a short-time stamp, and a long stopwatch circuit operative for generating at intervals a long-time stamp. Data to be logged with the short-time stamp is combined therewith and

APPLE-1121.

is being tuned. For example, video frames of the video content may have time stamps which indicate the elapsed time since the start of the content, e.g., 41 minutes and 32 seconds have elapsed in the video content. Also, key frames may have

APPLE-1123, [0093].

display and sound reproduction. The audio-video clip includes time stamps that indicate elapsed times within the clip. The process begins streaming the clip at an initial time

APPLE-1125, [0047].

Time Stamp 207 may therefore specify an elapsed time from commencement of rendering,

APPLE-1124, 5:24-6:2.

FISH.

'037 Pet., 47-57; '037 Pet. Rep., 16-21.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

’037 Issue 3

Ono-Hutchings Renders Obvious “interpreting… movement data based on … a real-time clock” [20c]

[20c]: “***interpreting***, using a microprocessor included in the portable, self-contained movement measuring device, said ***physical movement data based on*** user-defined operational parameters and ***a real-time clock***;”

FISH.

Ono-Hutchings Renders Obvious "interpreting… movement data based on… a real-time clock" ([20c])

Ono and Hutchings

manner, at Step a_{11}, a mean walking speed during a time period of 10 sec is calculated from the stride-length

APPLE-1101, 15:36-37.

perform the integration. Once the length of steps is determined, the elapsed time is used to obtain the speed of the person, and the sum of the step lengths is used to obtain

APPLE-1102, 3:18-20.

of distances for all cycles. The velocity of travel is the distance of the cycle, or several cycles, divided by the time it takes to travel this distance. The height jump is not

APPLE-1102, 11:1-3.

Dr. Kenny's Declaration

136. Additionally, Ono-Hutchings interprets/analyzes movement data to calculate speed, which is the rate of change of distance with time, and velocity, which is the distance divided by time. APPLE-1101, 15:35-42; APPLE-1102, 3:18-21, 11:1-3. As described in Ono, distance can be determined based on user selected exercise mode and user set stride length, and the time is a "time period of 10 sec." APPLE-1101, 15:61-62. Thus, the microprocessor interprets physical movement data based on user-defined operational parameters, including selection and starting of step-counting, selection of run mode, selection of exercise mode, and setting of stride length, target distance, and target number of steps, and based on 10 seconds having lapse that is determined using a real-time clock.

APPLE-1100, ¶136.

FISH.

'037 Pet., 71-73; '037 Pet. Rep., 22-23

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Patent Owner's Uncorroborated Argument Ignores Ono's Express Disclosure

Patent Owner Response and Sur-Reply

For the limited purpose of this ground, PO does not dispute that a POSITA could have implemented *Ono's* device such that it would have a real-time clock.

'037 POR, 30.

1f. Additionally, if the real-time clock *is* only used only for duration, then there would be no reason to add a real-time clock in the first place—defeating Petitioner's obviousness argument (that "it would have been obvious to implement Ono's device to have a real-time clock," Paper 21 at 22)—because there would be no need for the clock to be "***real-time***" if it is only used to measure durations.

'037 PO Sur-reply, 12.

Ono

RAM **52** to be described below. Further, the control section **49** sends the time-data, i.e., the present-time data comprising minute-data, hour-data, date-data and month-data to the display section **57** through the display-control circuit **56** and the display section **57** displays the present-time data. The control section **49** con-

APPLE-1101, 9:14-31.

Dr. Kenny's Declaration

31. Based upon my knowledge and experience in this field, instead of relying on the processor to determine the time data from the one Hz signal, a POSITA would have found it obvious to consider implementing the Ono-Hutchings device with a discrete, external real-time clock connected to the microprocessor for obtaining "time-data, i.e., the present-time data comprising minute-data, hour-data, date-data

APPLE-1100, ¶100.

advantageously reducing the calculations that are performed by the microprocessor and conserving power to the system when there are no processing tasks for the microprocessor. *See, e.g.,* APPLE-1009, 9:59-67 (describing using multiple

APPLE-1100, ¶102.

'037 Pet., 58-59.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

’040 and ’037 Common Issue 4

The Testimony of Patent Owner’s Declarant
is Entitled to no Weight

FISH.

The Testimony of Patent Owner's Declarant is Entitled to no Weight

37 C.F.R. § 42.65(a)

(a) Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight. Testimony on United States patent law or patent examination practice will not be admitted.

'040 Madisetti Declaration (EX2005)

47. One purpose of Allum is to monitor subjects who are in danger of falling.

48. Allum does not teach or suggest to a POSITA that it should be modified to include Conlan's pushbuttons for user input because the design scheme of Allum neither requires, nor provides a means for, user input about his or her own stability condition.

49. A POSITA would have read Allum to suggest that a designer should refrain from including user inputs for at least two reasons. First, the patients who would use the Allum device are inherently "prone to abnormal falling" as Allum suggests, and likely may not be able to sense or feel instability, as would be required to provide input via the Conlan pushbuttons.

'040 Petitioner Reply

VII. DR. MADISETTI'S TESTIMONY SHOULD NOT BE GIVEN ANY WEIGHT

As explained in more detail below, Dr. Madisetti's testimony is not cited to and is not supported by underlying facts. Moreover, when clarification of statements was sought during deposition, Dr. Madisetti refused to provide it.

The POR does not provide a single citation to Dr. Madisetti's declaration, Exhibit 2005. Thus, Exhibit 2005 should not be given any weight as it is unclear how his remarks are pertinent to any arguments. And even if consideration were to be given to uncited Exhibit 2005, Dr. Madisetti's testimony is not based on underlying facts. In the 60-paragraph declaration, only ¶¶[32]-[35] (which are directed to disclosure of the '576 Patent) and ¶[59] have any citations. The entire section (¶¶[45]-[60]) discussing the prior art references has no citations other than two citations in ¶[59]. Per 37 C.F.R. §42.65(a), "[e]xpert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."

'040 Pet. Rep., 29; *see also* '040 Pap. 18, 1-2; '037 Pap. 18, 1-2.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Madisetti's Prior Art Discussion Consists of Conclusory Statements without Disclosure of Underlying Facts or Data

37 C.F.R. § 42.65(a)

(a) Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight. Testimony on United States patent law or patent examination practice will not be admitted.

'040 Madisetti Declaration (EX2005)

C. Apple's Cited References

45. Allum is a diagnostic and rehabilitory tool that measures postural sway of a human subject using displacement or motion transducers using displacement or motion transducers and provides feedback to the subject

46. Essentially, Allum is a full-body, posture-correcting device that detects motion using angular rate transducers attached to the subject's body, then relays that information to a microprocessor which exports the data to the device's various feedback systems.

47. One purpose of Allum is to monitor subjects who are in danger of falling.

48. Allum does not teach or suggest to a POSITA that it should be modified to include Conlan's pushbuttons for user input because the design scheme of Allum neither requires, nor provides a means for, user input about his or her own stability condition.

49. A POSITA would have read Allum to suggest that a designer should refrain from including user inputs for at least two reasons. First, the patients who would use the Allum device are inherently "prone to abnormal falling" as Allum suggests, and likely may not be able to sense or feel instability, as would be required to provide input via the Conlan pushbuttons.

50. Because the Allum device is designed to rely on objective data measured by "body sway sensors" to determine whether a user has approached dangerously close to, or exceeded, the threshold "cone of stability," the addition of inputs from users who are inherently incapable of normal fall control would not serve the purposes of the device, but rather distract and confuse the device's designed monitoring and warning operations.

51. In the context of Element 1d-3, an examination of Allum shows the "time stamp" reflects the time at which the time stamp was ***logged***—which is later than when the movement data ***occurred***.

52. Upon examination of Figure 6 of Allum, A POSITA would understand from Allum that the method of Figure 6 is performed from top to bottom, with simultaneous events being placed side-by-side. The general process is repeated in a loop, where the angular velocity sensors are sampled, then the angular position is calculated by integration, then the displays are updated, then the warnings are issued, and then they are logged. At least three steps occur between the movement and the logging (steps 138, 140, and 142), and the alleged "time stamp" reflects a time ***after*** the movement data occurred—so Allum does not disclose Element 1d-3.

53. If "Raymond teaches that '[a]s the data is collected, it is ***time stamped***, compressed (where appropriate) and uploaded to the database, labeled for the patient in question. And the resulting health history is a combined format of objective physical parameters and subjective patient data which is ***time-indexed for subsequent retrieval and analysis***.'" There is still no indication that the "time-index" or "time stamp[]" is "related to" any "***detected*** first user-defined event," as required by Element 1d-3. They are apparently merely saved for later assessment, and there is no indication that any event has been detected.

54. The Allum device is designed to operate in a manner that is helpful to detect abnormal sway in patients with gait disorders. Consequently, the Allum device depends on the device operating automatically without input from the user. The Conlan buttons would not be compatible with this mode of operation.

55. As it relates to Ground 1, Element 20c, logging is not interpretation. Interpretation requires an analysis of the movement data which does not occur in Allum during the logging process. Allum merely ***logs*** the time of day associated with an event.

56. Even under the assumption that Allum does contain a real time clock that it uses to associate a time of day with the warnings issued to the user, the real time clock would be the basis for logging the issuance of a warning, not the basis for the microprocessor interpreting "said physical movement data." Therefore, Allum's "time of day" logging does not disclose this limitation as it is not interpreting underlying movement data, it is merely providing the time of day associated with the issuance of a warning. Likewise, even if one were to assume the existence of a real time clock in Allum, Allum still fails to connect the real time clock with the interpretation of movement data, and thus, there is no interpretation of physical movement data based on a real-time clock.

57. Upon examination of Raymond, it is clear that the Raymond RT clock is not associated with the underlying **"physical movement data."** It is not used to interpret the objective sensor **physical movement data** at all and is only associated with the subjective user inputs.

58. When considering the combination of Allum, Raymond, Conlan and Gaudet, A POSITA would not have been motivated to combine these four different inventions as they are in different fields of endeavor and aim to solve different problems.

59. Gesink discloses a design scheme where ***the device tells the user*** about the user's conditions (direction and veer) that the user himself or herself has not detected, and likely not capable of detecting. EX1014 at Abstract, 4:27-28. On the other hand, Raymond is designed for ***the user to tell the device*** about the user's condition, the exact opposite of the design scheme and stated purpose of Gesink's device. EX1009 at 5:40-41. Gesink does not teach or suggest to a POSITA that it should be modified to include Raymond, including due to the disparity between the purposes and uses of the references.

60. Gesink stores the user-defined operational parameters and movement data ***before*** any user-defined event is detected, and the event is detected later based on the stored data.

'040 EX2005, ¶¶45-60
'040 Pap. 18, 1-2; '037 Pap. 18, 1-2.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Madisetti Refused to Clarify his Testimony

Madisetti Depo. Transcript

Q. The claim says that a movement sensor is capable of measuring data. What do you understand is the meaning of "capable of"?

…

MR. KHAN: Yeah, I'm asking what is meant by the words "capable of."

THE WITNESS: And I would say just capable of.

APPLE-1040, 78:16-79:12.

’040 Petitioner Reply

Compounding the egregious omissions and lack of evidentiary support was Dr. Madisetti’s refusal to answer questions and provide clarification of his statements during his deposition. *See e.g.*, APPLE-1040, 30:3-20 (refusing to provide his understanding of “time-stamp”); APPLE-1040, 52:2-14 (refusing to explain details of a figure he drew and included in his declaration); APPLE-1040, 78:16-84:4 (“capable” means “capable;” “related to” means “related or has a relation to”). For the foregoing reasons, Dr. Madisetti’s testimony should not be given any weight.

’040 Pet. Rep., 30.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Madisetti Refused to Clarify his Testimony

Madisetti Depo. Transcript

BY MR. KHAN:

Q. Thank you. I understand what the claim says, but I'm asking you for your interpretation of the term "time stamp," not what the claim reads.

If you can please answer the question, which is: What is your understanding of the word "time stamp"?

MR. PHILLIPS: Objection, form. Objection, scope.

THE WITNESS: As I said, Counsel, I am not here to offer a full claim construction of the term. As I've described, that the '56 patent in paragraph 32 provides, for example, the microprocessor is connected to a real-time clock to provide date and time information to the microprocessor, Column 5, 35 to 37. These are exemplary, nonlimiting embodiments that are discussed.

APPLE-1040, 30:3-20.

'040 Petitioner Reply

Compounding the egregious omissions and lack of evidentiary support was Dr. Madisetti's refusal to answer questions and provide clarification of his statements during his deposition. *See e.g.,* APPLE-1040, 30:3-20 (refusing to provide his understanding of "time-stamp"); APPLE-1040, 52:2-14 (refusing to explain details of a figure he drew and included in his declaration); APPLE-1040, 78:16-84:4 ("capable" means "capable;" "related to" means "related or has a relation to"). For the foregoing reasons, Dr. Madisetti's testimony should not be given any weight.

'040 Pet. Rep., 30.

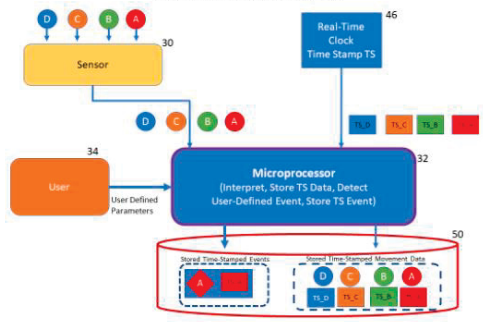
Madisetti Refused to Clarify his Testimony

Madisetti Depo. Transcript

Q. So you drew -- you drew this figure; is that correct?
A. Yes.
Q. But you don't know where the movement data is coming from?
A. As I said, Counselor, I don't offer a specific opinion on that. All I'm saying is that the microprocessor receives, interprets, stores, and responds to said movement data that's received based on user-defined operational parameters.
Q. So how can it do that if you cannot explain to me where the movement data is coming from?
MR. PHILLIPS: Objection, form. Objection, scope.
THE WITNESS: As I said, Counsel, I disagree with that characterization.

APPLE-1040, 52:16-53:10; '040 Pet. Rep., 29-30.

Madisetti Declaration (top) vs. '576 Patent (bottom)



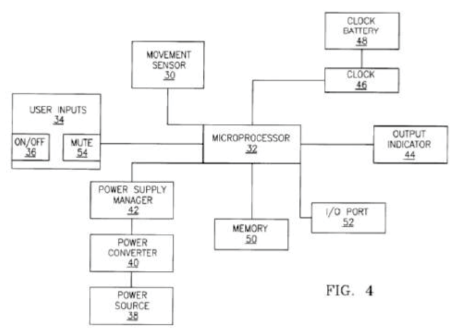


FIG. 4

'040 EX2005, 20; EX1001, FIG. 4.

Appendix

Additional Slides

Asserted Grounds

IPR2022-00037 Petition (“ ’037 Pet.”)

Ground	Claims	35 U.S.C. §103 Combination
1	**1, 3-5, 8, 10, 20, 25, 30, 39, 41, 42, 61-65**	Ono and Hutchings
2	**1, 3-5, 8-11, 20, 25, 30, 36, 39-42, 61-65**	Ono, Hutchings, and Amano
3A	**1-5, 8, 10, 20, 25, 30, 31, 39, 41, 42, 45-47, 49, 61-65**	Ono, Hutchings, and Conlan
3B	**48, 50, 51**	Ono, Hutchings, Conlan, and Hickman
4	**1, 3-5, 8, 10, 20, 25, 30, 39, 41, 42, 61-65, 144, 147**	Ono, Hutchings, and Kaufman
5A	**1-5, 8-11, 20, 25, 30-32, 36, 39-42, 45-47, 49, 61-65, 144, 147**	Ono, Hutchings, Amano, Conlan, and Kaufman
5B	**48, 50, 51**	Ono, Hutchings, Amano, Conlan, Kaufman, and Hickman
6A	**1-5, 8-11, 20, 25, 30, 31, 36, 39-42, 45-47, 49, 61-65**	Ono, Hutchings, Amano, and Conlan
6B	**48, 50, 51**	Ono, Hutchings, Amano, Conlan, and Hickman
7	**1, 3-5, 8-11, 20, 25, 30, 36, 39-42, 61-65, 144, 147**	Ono, Hutchings, Amano, and Kaufman
8A	**1-5, 8, 10, 20, 25, 30, 31, 39, 41, 42, 45-47, 49, 61-65, 144, 147**	Ono, Hutchings, Conlan, and Kaufman
8B	**48, 50, 51**	Ono, Hutchings, Conlan, Kaufman, and Hickman

’037 Pet., 13-14.

IPR2022-00040 Petition (“ ’040 Pet.”)

Ground	Claim(s)	35 U.S.C. § 103 Combination
1	**1-5, 8-11, 20, 25, 30, 36, 39-42, 45-51, 61-63, 144, 147**	Allum in view of Raymond and Conlan
1A/2	**31, 32**	Allum in view of Raymond, Conlan, and optionally de Remer
3	**64, 65**	Allum in view of Raymond, Conlan, and Gaudet
4	**20, 25**	Gesink in view of Raymond

’040 Pet., 1-2.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

’037 Issue A1

Ono-Hutchings Renders Obvious “movement sensor” and “movement measuring device” [1a], [1k], [20a]

[1a]: “***a movement sensor capable of measuring data associated with unrestrained movement in any direction*** and generating signals indicative of said movement”

’037 [1k] / ’040 [1i]: “wherein said ***movement sensor measures the angle*** and velocity of said movement.”

[20a]: “attaching a portable, self-contained ***movement measuring device*** to said body part ***for measuring unrestrained movement in any direction***;”

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Ono-Hutchings Renders Obvious the "movement sensor" and "movement measuring device" ([1a], [1k], [20a])

Dr. Kenny's Declaration

Ono's acceleration sensor 40, waveform-shaping section 47, and counter 48 form a movement sensor that measures data and generates signals indicative of movement.

APPLE-1100, ¶67.

70. Hutchings' measuring system forms a movement sensor capable of measuring data associated with unrestrained movement in any direction and generating signals indicative of the movement.

APPLE-1100, ¶70.

Ono

an exercise measuring instrument comprising: an acceleration sensor to be worn on a body of an exerciser, for outputting a waveform signal representative of an acceleration which is received by said acceleration sensor in response to movements of said exerciser; am-

APPLE-1101, 2:1-7.

wrist watch in the same manner as in FIG. 1. The output signal of the acceleration sensor 40 is applied to a waveform-shaping section 47 and the waveform-shaping section 47 shapes the output signal of the acceleration sensor 40 into a pulse signal having a square waveform. The pulse signal outputted from the waveform-shaping section 47 is counted by a counter 48 and the count data is supplied to a control section 49. The con-

APPLE-1101, 8:60-67.

accordance with the micro-programme. The control section 49 calculates the number of steps on the basis of the count data delivered from the counter 48 and further calculates the number of steps or a distance-walked on the basis of the count data of the counter 48 and stride-length data previously stored in a RAM 52

APPLE-1101, 9:5-10.

Hutchings

displacement is used to determine the height jumped. One set of three-component linear accelerometers and one set of three-component rotational sensors may be employed to resolve the absolute motion of a person from the motion of

APPLE-1102, 3:22-25.

employed. In FIG. 6, unit 48 may preferably contain the linear accelerometers employed to measure accelerations Ax, Ay and Az and frequency filters (not shown). Such filters

APPLE-1102, 8:49-51.

Unit 50 may preferably contain rotational sensors employed to measure θx θy and θz signals. Thus the rotational sensors provide the angle of rotation along each axis of the translational coordinate. The output terminals of units 48 and 50 are coupled to input terminals of a processor

APPLE-1102, 8:56-60.

model ADXL05. Each accelerometer may convert the measured acceleration into a corresponding signal, which may be preferably employed by microprocessor 6 to accomplish movement measurements.

APPLE-1102, 5:9-12.

those provided by AMP model numbers ACH-04-08. Each rotational sensor converts the measured angle into a corresponding signal, which is employed by a microprocessor 6 to calculate information related to the user's movements, such as user's speed, distance traveled and the height

APPLE-1102, 4:60-64.

In accordance with another embodiment of the invention, instead of accelerometers velocity sensors may be employed. For a measuring system that employs a velocity

APPLE-1102, 12:58-60.

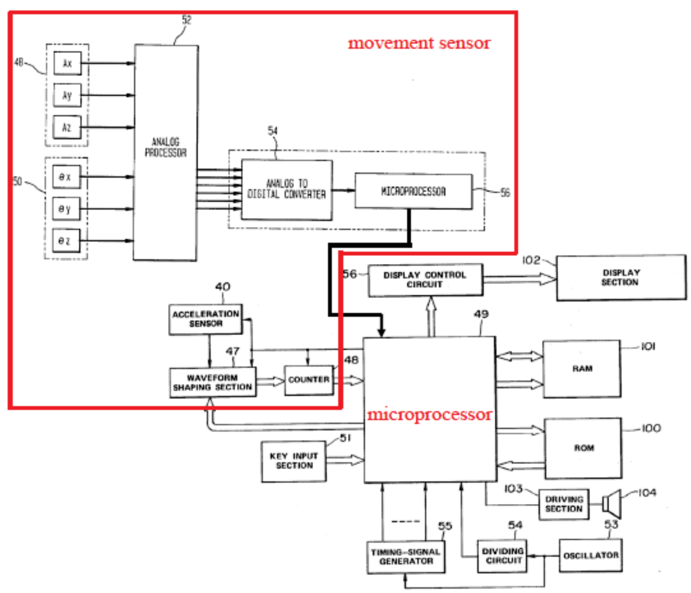
'037 Pet., 28-30; '037 Pet. Rep., 6-8.

Ono-Hutchings Renders Obvious the "movement sensor" and "movement measuring device" ([1a], [1k], [20a])

Dr. Kenny's Declaration

71. In accordance with the construction of "movement sensor" discussed in Section V.C, the block diagram below shows an example of a device with a movement sensor (enclosed in red) that includes Ono's acceleration sensor 40, waveform-shaping section 47, and counter 48, and Hutchings' measuring system:

Ono-Hutchings movement sensor



FISH.

APPLE-1100, ¶71; '037 Pet., 28-30; '037 Pet. Rep., 6-8.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Ono-Hutchings Renders Obvious "unrestrained movement" ([1a], [20a])

Patent Owner Sur-Reply

First, Petitioner is incorrect—its original Petition had no "clear and detailed explanation" of the "unrestrained movement" limitation. Rather, the cited portion (which contains the only mention of the word "unrestrained" in the body of the Petition) is a ***single sentence*** (backed only by a long, unexplained string cite) making the bare assertion that "Ono-Hutchings' movement sensor measures unrestrained movement in any direction through accelerometers that measure accelerations in three dimensions, and rotational sensors that provide the angle of rotation along each axis of the translational coordinate." Paper 3 at 28. While this argument may have touched on the "in any direction" limitation, it does not address the "unrestrained" limitation.

'037 PO Sur-reply, 5.

Petition (top) and Dr. Kenny's Declaration (bottom)

If Ono's movement sensor were considered to not be capable of measuring data associated with unrestrained movement in any direction, Ono-Hutchings' movement sensor measures unrestrained movement in any direction through accelerometers that measure accelerations in three dimensions, and rotational sensors that provide the angle of rotation along each axis of the translational coordinate. APPLE-1102, 2:45-61, 3:22-26, 4:44-6:54, 8:44-59, 9:59-10:2, FIG. 6; APPLE-1101, 13:40-42, 18:28-19:6; *supra* Section III.A.3; *infra* Ground 1, claim 5; APPLE-1100, ¶¶68-70. "Each accelerometer may convert the measured

'037 Pet., 28-29.

68. If Ono's movement sensor were considered to not be capable of measuring data associated with unrestrained movement in any direction, Ono-Hutchings yields a device including accelerometers to measure accelerations in three dimensions and rotational sensors to provide the angle of rotation along each axis of the translational coordinate. APPLE-1102, 3:22-26 ("One set of three-component linear accelerometers and one set of three-component rotational sensors may be employed to resolve the absolute motion of a person..."), 4:44-6:54, 8:44-59, 9:59-10:2, FIG. 6; *supra* Section VI.A.3; *infra* Ground 1, claim 5. "Each

APPLE-1100, ¶68.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Ono-Hutchings's Movement Sensor "measures the angle" ([1k])

Patent Owner Sur-Reply

LoganTree pointed out in its Response that the Petition makes no argument (and cites no evidence showing) that Ono-Hutchings discloses the "movement sensor measures the angle … of said movement" limitation of Element 1k. *See* Paper 17 at 31. Petitioner's Reply incorrectly

'037 PO Sur-reply, 11.

Petitioner Reply

Petition's argument section for element [1k] includes a detailed discussion of velocity, as that was not previously discussed in the Petition, it does so with reference to the Ono-Hutchings's movement sensor as discussed in the Petition's analysis of element [1a]. Petition, 64; APPLE-1100, ¶106. As the Petition had established in the analysis of element [1a] prior to its analysis of element [1k], Hutchings discloses rotational sensors that measure the angle of movement. Petition, 28-29 (citing APPLE-1102, 4:60-65, 5:9-12, 8:49-61), 22-23; APPLE-1100, ¶¶68-70, 106. LoganTree does not dispute that Hutchings provides such disclosure. POR, 31.

'037 Pet. Rep., 8.

Petition

APPLE-1100, ¶106.

To the extent this limitation requires the movement sensor itself measure the velocity and if Ono-Hutchings' movement sensor (*supra* Ground 1, [1a]) were

'037 Pet., 64.

Dr. Kenny's Declaration

[1k] wherein said movement sensor measures the angle and velocity of said movement.

106. As discussed above, Ono-Hutchings yields a device with a movement sensor that includes the acceleration sensor (as suggested by Ono), and a set of three-component accelerometers and a set of three-component rotational sensors (as suggested by Hutchings). *Supra* Ground 1, [1a]; *supra* Section VI.A.3; APPLE-1101, 2:1-7, 3:10-4:13, 5:64-6:1, 6:41-48, 7:20-27, 7:61-68, 8:16-42, 8:58-60, 13:18-29, FIG. 14; APPLE-1102, 3:22-26 ("One set of three-component linear accelerometers and one set of three-component rotational sensors may be employed to resolve the absolute motion of a person…"), 4:44-6:54, 8:44-59, 9:59-10:2, FIG. 6. Also discussed above, Hutchings discloses that "[t]he total distance

APPLE-1100, ¶106.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Ono-Hutchings's Movement Sensor "measures the angle" ([1k])

Petition's analysis of element [1a]

If Ono's movement sensor were considered to not be capable of measuring data associated with unrestrained movement in any direction, Ono-Hutchings' movement sensor measures unrestrained movement in any direction through accelerometers that measure accelerations in three dimensions, and rotational sensors that provide the angle of rotation along each axis of the translational coordinate. APPLE-1102, 2:45-61, 3:22-26, 4:44-6:54, 8:44-59, 9:59-10:2, FIG. 6; APPLE-1101, 13:40-42, 18:28-19:6; *supra* Section III.A.3; *infra* Ground 1, claim 5; APPLE-1100, ¶¶68-70. "Each accelerometer may convert the measured acceleration into a corresponding signal," and "[e]ach rotational sensor converts the measured angle into a corresponding signal"; those signals are employed by a microprocessor 6 to calculate information related to the user's movements...." APPLE-1102, 4:60-65, 5:9-12.

'037 Pet., 28-29.

Dr. Kenny's analysis of element [1a]

68. If Ono's movement sensor were considered to not be capable of measuring data associated with unrestrained movement in any direction, Ono-Hutchings yields a device including accelerometers to measure accelerations in three dimensions and rotational sensors to provide the angle of rotation along each axis of the translational coordinate. APPLE-1102, 3:22-26 ("One set of three-component linear accelerometers and one set of three-component rotational sensors may be employed to resolve the absolute motion of a person..."), 4:44-6:54, 8:44-59, 9:59-10:2, FIG. 6; *supra* Section VI.A.3; *infra* Ground 1, claim 5. "Each accelerometer may convert the measured acceleration into a corresponding signal, which may be preferably employed by microprocessor 6 to accomplish movement measurements." APPLE-1102, 5:9-12. "Each rotational sensor converts the measured angle into a corresponding signal, which is employed by a microprocessor 6 to calculate information related to the user's movements, such as user's speed, distance traveled and the height jumped." APPLE-1102, 4:60-65.

APPLE-1100, ¶68.

FISH.

’040 Issue A2

A POSITA Would have been Motivated to Combine ARC and de Remer

Claims 31 and 32

[31]: The device of claim 1, wherein said microprocessor is configured to ***retrieve said first time stamp information from said real-time clock*** based on the detection of the user-defined event.

[32]: The device of claim 31, wherein said microprocessor is configured to ***retrieve said first time stamp information from said real-time clock*** based on the detection of the user-defined event.

FISH.

Overview of de Remer

de Remer

506 to check the state of E1DEQU. During flow block **507**, E1DEQU closes the currently open data group record in SCF **76** by placing the current time and date from real-time clock **8** in the ending timestamp field of that data group record. This step is necessary since an

APPLE-1013 (de Remer), 23:16-20.

An embodiment of the invention is a method for creating a control record for use in future machine recovery of gaps in a complete series of journal data formed by a computing machine from a complete series of transactional data. The method includes forming a copy of the series of journal data for transmission to a remote site, forming a plurality of data group records, each data group record identifying a different boundary of each of a plurality of data groups in the series of journal data, detecting the presence of a gap in the copy of the journal data for transmission, and creating one of said data group records for a boundary of each gap.

APPLE-1013, 2:29-40.

Dr. Kenny's Declaration

91. De Remer is related to "a method for creating a control record for use in future machine recovery of gaps in a complete series of journal data formed by a computing machine from a complete series of transactional data." APPLE-1013, 2:29-40. To create a record/data log, de Remer teaches "placing the current time and date from real-time clock 8 in the ending timestamp field of that data group record." APPLE-1013, 23:13-23, 9:25-61.

'040 APPLE-1003, ¶91; '040 Pet., 63-64.

de Remer Discloses how to use RTC Information to Populate a Timestamp Field

de Remer

Assume the system is at block **505**. If a shutdown has been requested, control passes to block **507** and E1-DEQU **92** stops. Otherwise control is passed to block **506** to check the state of E1DEQU. During flow block **507**, E1DEQU closes the currently open data group record in SCF **76** by placing the current time and date from real-time clock **8** in the ending timestamp field of that data group record. This step is necessary since an open record indicates that E-NET1 is currently running or has improperly stopped.

APPLE-1013, 23:13-23.

Dr. Kenny's Declaration

92. To understand how a timestamp field used by ARC's device would have been populated, a POSITA would have turned to the teachings of de Remer, which explains that date and time information from the RT clock (also disclosed in ARC's device) is used to fill up the fields in a timestamp. APPLE-1013, 23:13-23. Indeed, such a combination would have been obvious because it merely involves combining prior art elements (ARC and de Remer's RT clock and timestamp) according to known methods to yield predictable results (filling the fields of a timestamp using date and time information from the RT clock). Such a combination would have been predictable and foreseeable as a POSITA would have turned to a RT clock of the device in order to obtain time and date information for a timestamp and associate the retrieved first time stamp information with said first user-defined event, as taught by the combination of Arc and de Remer.

'040 APPLE-1003, ¶92; '040 Pet., 64-65.

A POSITA would have Combined ARC and de Remer to Retrieve first time Stamp Information from the RTC

de Remer

Assume the system is at block **505.** If a shutdown has been requested, control passes to block **507** and E1-DEQU **92** stops. Otherwise control is passed to block **506** to check the state of E1DEQU. During flow block **507**, E1DEQU closes the currently open data group record in SCF **76** by placing the current time and date from real-time clock **8** in the ending timestamp field of that data group record. This step is necessary since an open record indicates that E-NET1 is currently running or has improperly stopped.

APPLE-1013, 23:13-23.

Petitioner Reply

Claim 1 of the '576 Patent recites, among other features, "a real-time clock connected to said microprocessor" and "storing … first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred." Based on these features alone, the '576 Patent inventor would have to consider the problem of how to obtain and store first time stamp information when using a real-time clock. De Remer explains how the date and time information from a RT clock (part of ARC's device) can be used to fill up the fields in a timestamp, and thus is reasonably pertinent to the same or similar problem facing the inventor. APPLE-1013, 23:13-23; APPLE-1003, ¶¶[170], [92]; Pet., 64. LoganTree's broad characterization of the '576 Patent's "main problem" being "the tracking of a person's movement" fails to recognize all the problems that the inventor would have to address, and fails to address problems related to the recited claim features. POR, 40. For at least this reason, De Rember is analogous art.

'040 Pet. Rep., 24.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

’040 Issue A3

A POSITA Would have been Motivated to Combine ARC and Gaudet

Claims 64 and 65

[64]: The device of claim 1, wherein said movement sensor is configured to ***measure a walking distance***.

[65]: The device of claim 64, wherein said device is configured to be wearable by the user, and said movement sensor is configured to ***measure said walking distance of said user***.

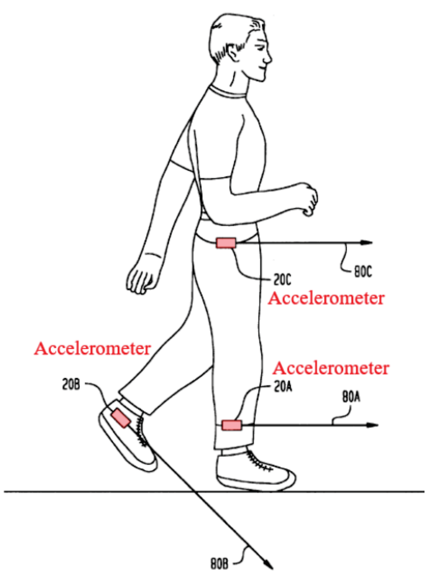
FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Gaudet

Gaudet

FIG. 2



APPLE-1012 (Gaudet), FIG. 2.

Dr. Kenny's Declaration

85. Gaudet discloses using accelerometer(s) to sense subject movement in "a direction substantially parallel to the bottom of a subject's foot. APPLE-1012, Abstract. A time interval during which the subject's movement is measured along with data obtained from the accelerometer(s) is used to determine the subject's pace and distance traveled. APPLE-1012, Abstract, 2:6-26, 2:47-53, 15:37-47, 16:19-23, FIGS. 11, 13.

'040 APPLE-1003, ¶85; '040 Pet., 67.

86. In particular, as shown in Gaudet's FIG. 2 below, accelerometer "device 20A is mounted on the ankle of the [subject], [accelerometer] device 20B is mounted on or within the shoe of the user, and [accelerometer] device 20C is mounted on the waist of the user, with the acceleration sensing axises [*sic*] of the devices being oriented as indicated by arrows 80A, 80B and 80C, respectively." APPLE-1012, 4:50-67, 16:45-60.

'040 APPLE-1003, ¶86; '040 Pet., 67.

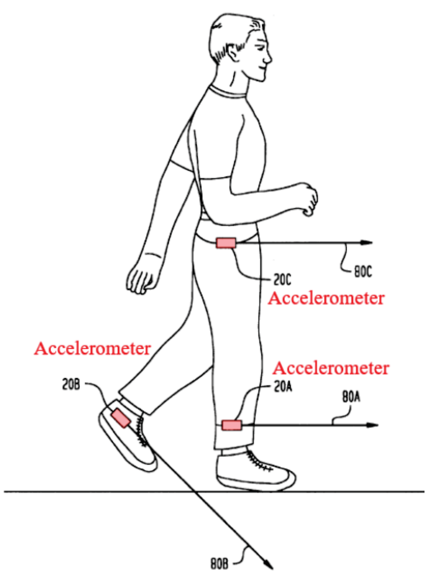
FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Gaudet

Gaudet

FIG. 2



APPLE-1012 (Gaudet), FIG. 2.

Dr. Kenny's Declaration

87. Gaudet explains that it can use the output of the accelerometers to determine the walking distance of a subject in the following manner:

> According to the invention, a method and an apparatus are disclosed in which an output of an accelerometer is used to determine: (1) instances at which a foot of a user in locomotion leaves a surface, and (2) instances at which the foot of the user impacts the surface. By measuring the time difference between each instance at which the foot impacts the surface and the following instance at which the foot leaves the surface, several periods of time that the foot was in contact with the surface during strides taken by the user, i.e., several foot contact times, may be measured accurately and reliably. By calculating an average of these several measured foot contact times, an average foot contact time may be determined, from which information such as the pace of the user, rate of travel, distance traveled, etc., may be calculated. Additionally, by measuring time differences between the instances at which the foot of the user leaves the surface and the following instances at which the foot impacts the surface, the average period of time that the foot was not in contact with the surface, i.e., the average foot loft time, between strides taken by the user also may be calculated.

88. APPLE-1012, 2:6-26, *see also* 4:62-68.

'040 APPLE-1003, ¶¶87-88; '040 Pet., 69.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

A POSITA Would have been Motivated to Combine ARC and Gaudet to Measure Walking Distance

Dr. Kenny's Declaration

subject, as taught by Gaudet. A POSITA would have been combined the teachings of ARC and Gaudet so that ARC's measuring device can additionally measure and provide data for movements like walking while using existing hardware (accelerometers), and because using an accelerometer that is placed on a subject's body and not just in the subject's shoe would have provided an "affordable, reliable, easy to use and accurate" measurement of the subject's walking distance and pace. APPLE-1012, 1:35-2:3. Such a combination would have been predicable and foreseeable because providing additional data such as the user's walking distance would have been consistent with Allum and Raymond's objectives to provide a history of the user's movements. In addition, using accelerometers to measure distance traveled by the user was already well-known and thus would have been obvious extension of Allum's accelerometers. APPLE-1012, 1:35-67. The combination of ARC's accelerometers arranged according to Gaudet's teachings provides a more "affordable, reliable, easy to use and accurate" accelerometer-based measurement. APPLE-1012, 1:35-2:3.

'040 APPLE-1003, ¶89; '040 Pet., 69-70.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

’040 Issue A4

A POSITA Would have been Motivated to Combine Gesink and Raymond

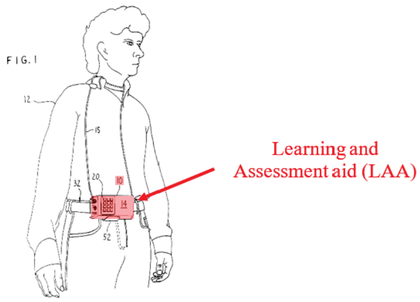
Independent Claim 20 (overlaps with claim 1)

Dependent Claim 25: The method of claim 20 wherein said movement measuring device is an accelerometer.

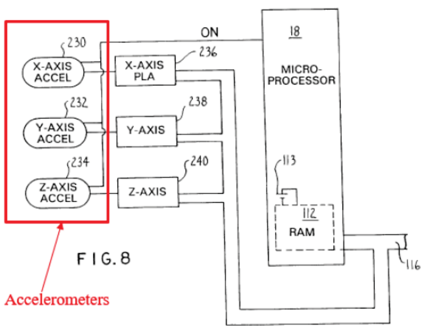
FISH.

Overview of Gesink

Gesink



APPLE-1014 (Gesink), FIG. 1; '040 Pet., 72; APPLE-1003, p51.



APPLE-1014, FIG. 8; '040 Pet., 73; APPLE-1003, p52.

Dr. Kenny's Declaration

95. The LLA 10 includes a housing 14 with internal components such as a "gyroscope or other sensor" and a "microprocessor 18." *Id.*, 2:59-61, 4:12-32. In some implementations, accelerometers can be used in place of the gyroscope. *Id.*, 16:16-31, FIG. 8 (reproduced below).

98. As the individual performs the walking test, "the microprocessor 18 receives signals based on those produced by the sensor (e.g., gyroscope 16, accelerometer(s)) and generates output signals that provide an indication of the individual's movement," including an indication of the individual's "veer and tilt." APPLE-1014, 4:15-24, 13:22-28.

100. Gesink teaches that the LLA measures the distance a subject walks using displacement data generated by the accelerometers. *Id.*, 14:30-35, 16:23-47. In addition to announcing and presenting messages related to the walking-test on the display, "the veer and tilt data collected by the learning aid are stored." *Id.*, 15:14-15.

'040 APPLE-1003, ¶¶ 95, 98, 100; '040 Pet., 71-75.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

A POSITA would have Incorporated Raymond's RTC and Timestamp into Gesink's system

Gesink

In step **172** the microprocessor **18** compares the filtered veer value to the maximum veer value previously entered by the individual **12**. If the filtered veer value is greater than the maximum veer value, microprocessor **18** proceeds to execute a step **174** in which an announcement is generated informing the individual **12** that the maximum veer was exceeded and the time into the test at which it was exceeded.

APPLE-1014, 13:53-60.

turns with some degree of accuracy. Also, by connecting the learning and assessment aid to a computer through data socket **29**, an incremental, moment-by-moment analysis of the individual's ambulatory movement can be obtained and recorded. When, for example, this recording is performed for straight-line testing it includes an indication of: the time since the start of the test; the raw, cumulative, veer; the filtered veer; the raw, cumulative, pitch, the incremental change in direction; the incremental change in pitch; and the incremental change in compensation factor used to provide the filtered direction. All of this data can be printed out or displayed in order to enable persons working with the individual **12** using the learning and assessment aid **10** to analyze the individual's ambulatory movement patterns in order to help the individual develop desirable ambulatory motion patterns.

APPLE-1014, 15:46-50.

Dr. Kenny's Declaration

102. A POSITA would have combined Gesink and Raymond to produce the obvious, foreseeable, and predictable result of Gesink's wearable learning aid having a real-time clock for generating time data and supporting the sequencing and time-stamping of data and for the various reasons noted below.

'040 APPLE-1003, ¶ 102; '040 Pet., 76.

time data with detected body-motion events. For example, Gesink teaches that when the microprocessor detects that a subject's walking motion has exceeded a maximum veer, it generates an announcement "informing the individual 12 that the maximum veer was exceeded and the time into the test at which it was exceeded." APPLE-1014, 13:55-59. Gesink also teaches recording an incremental, moment-by-moment analysis of the individual's ambulatory movement including "the time since the start of the test." *Id.*, 15:46-60. That is, all data "regarding the use of the aid 10 by individuals," including the time data, may be stored on the learning aid and "later downloaded to a an [sic] external data storage device." *Id.*, 17:65-67.

'040 APPLE-1003, ¶ 104, '040 Pet., 77-78.

Elapsed Time is "based on … real-time clock"

Petitioner Reply

LoganTree argues that Gesink and Raymond do not render obvious [20c] because (1) "simply put, elapsed time is not real time, and real-time measurements do not matter when a device is simply calculating elapsed time and synchronization pulses"; and (2) Raymond's RT clock is only associated with subjective user inputs. POR, 44.

LoganTree's first argument fails because the elapsed time of a test is ***based on*** time information provided by a real-time clock. [20c] does not require interpreting physical movement data ***in*** real time, but cites "based on … a real-time clock." Because the elapsed test time is determined from the real-time clock, the broad "based on … real-time clock" claim language is satisfied. APPLE-1014, 13:60-14:2; APPLE-1003, ¶[160].

'040 Pet. Rep., 27.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Patent Owner Mischaracterizes Raymond

Raymond

The monitor **108** collects objective data on the patient's physical condition via a plurality of automatically-controlled physiological sensors. The subjective data logger collects subjective information from the patient by providing the patient with an input device having data prompts such as questions regarding the patient's condition. Within the context of this description, the term "objective" data will refer to that data which is obtained by sensing the patient's physiological parameters. Correspondingly, the term "subjective" data will refer to that data which is input by the patient to the data logger **106**, regardless of whether that data pertains to the patient or the patient's environment, and whether or not the information is objective or factual, such as medication dosage or consumption of a particular food.

APPLE-1009, 5:30-44.

Petitioner Reply

Second, LoganTree's entire argument is based on a mischaracterization of Raymond. LoganTree alleges that "Raymond is designed for ***the user to tell the device*** about the user's condition." POR, 42-43. But Raymond uses monitor 108 to collect "objective data on the patient's physical condition via a plurality of automatically-controlled physiological sensors," and logger 106 to collect subjective data from a patient. APPLE-1009, 5:12-44. Accordingly, Raymond is not limited to the user telling the device about the user's condition. APPLE-1009, 5:12-44.

'040 Pet. Rep., 26.

FISH.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE