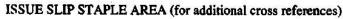
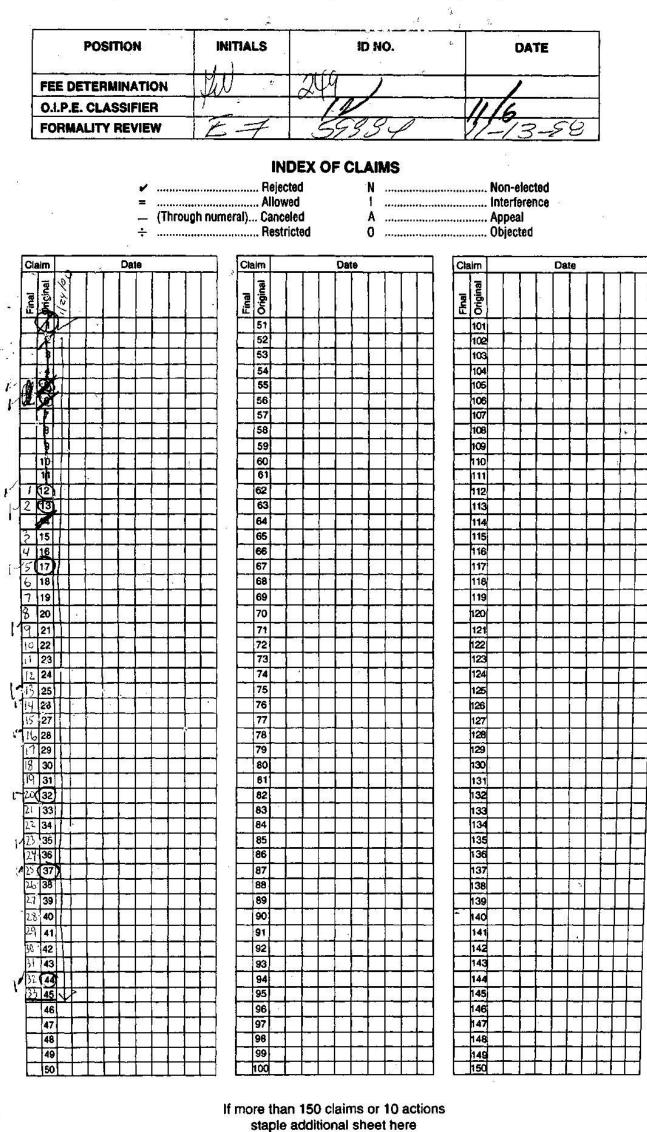
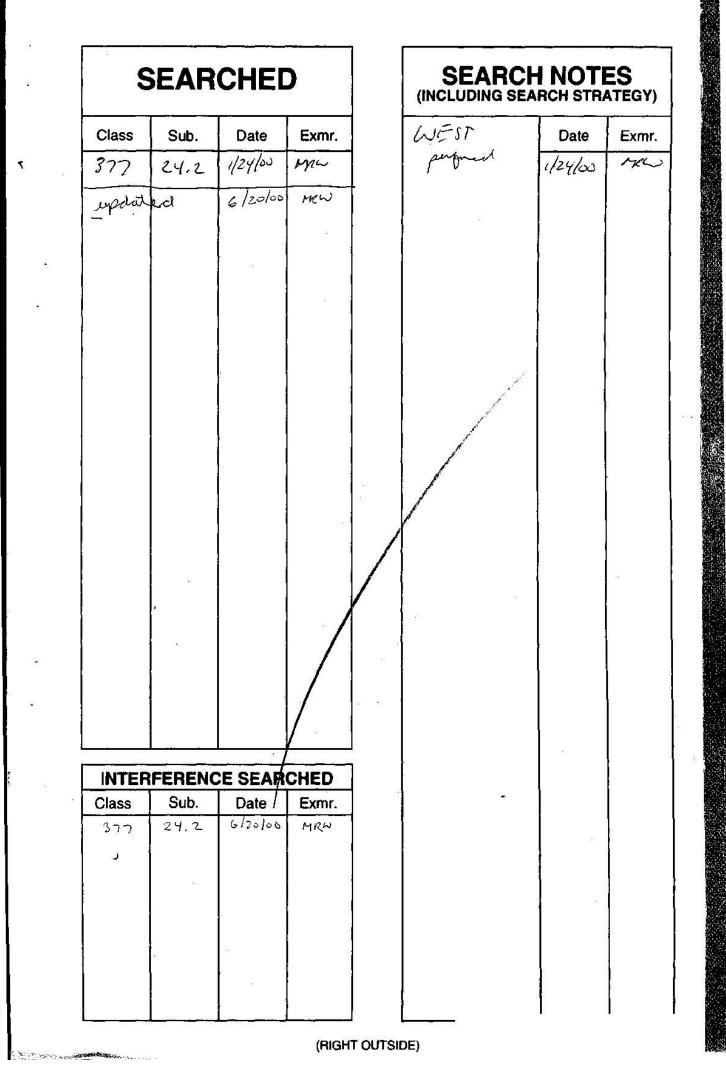
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# U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE FEE RECORD SHEET

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Printed 10/28/2000

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g,	PATENT APPLICATION	Firs	st Named Inventor or Application Identifier
	TRANSMITTAL	Nathan Pyl	
	(Only for new nonprovisional applications under 37 CFR 1.53(b))	Express Mail Labe	
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	APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application		Assistant Commissioner for Patients ESS TO: Box Patent Application Washington, DC 20231
	1. X Fee Transmittal Form (submit an original, and a duplicate for fee pro	6.	Microfiche Computer Program (Appendix)
	2. X Specification [Total Pages (preferred arrangement set forth below)		Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
	- Descriptive title of the Invention		a. Computer Readable Copy
	<ul> <li>Cross References to Related Applications</li> <li>Statement Regarding Fed sponsored R&amp;D</li> </ul>	F	b. Paper Copy (identical to computer copy)
	- Reference to Microfiche Appendix - Background of the Invention	Ţ	c. Statement verifying identity of above copies
	- Brief Summary of the Invention - Brief Description of the Drawings (if filed)		ACCOMPANYING APPLICATION PARTS
	- Detailed Description - Claim(s)	8.	Assignment Papers (cover sheet & document(s))
	- Abstract of the Disclosure	9.	37 CFR 3.73(b) Statement Power of
	3. X Drawing(s) (356 USC 113) [Total Sheets		(when there is an assignee) Attorney English Translation Document (if applicable)
	4. Oath or Declaration [Total Pages]		Information Disclosure Copies of IDS
			Statement (IDS)/PTO-1449 Citations
	a. Newly executed (original or copy)		Preliminary Amendment
	b. Copy from a prior application (37 CFR 1. (for continuation/divisional with Box 17 c		X Return Receipt Postcard (MPEP 503) ( (Should be specifically itemized)
	[Note Box 5 below]	14.	Small Entity Statement filed in prior
			Statement(s) application, Status still proper and desired
	i. <u>DELETION OF INVENTOR(S)</u> Signed statcment attached deleting invent named in the prior application, see 37 CF 1.63(d)(2) and 1.33(b).		Certified Copy of Priority Document(s) (if foreign priority is claimed)
	5. Incorporation By Reference (useable if Box 4b is check		Other:
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#### PATENT APPLICATION IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Pyles, et al. Applicant:

Filed: " Simultaneously herewith

For: Pedometer

**EPIXINC-4** Docket No.:

BOX PATENT APPLICATION Assistant Commissioner for Patents Washington, D.C. 20231

> "Express Mail" Mailing Label No.: EM164411845US Date of Deposit: October 28,1998

I hereby certify that these attached documents

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- Check in the amount of \$752.00
- PTO/SB/17 (1p) and 1 copy
- Specification and Claims (19 pages) and informal drawing (1 sheet) and unexecuted Declaration and Power of Attorney (4 pp)
- PTO/SB/05 (1p)

are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 35 C.F.R. §1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

(Jeffy W. Smith, Reg. No. 33455)

Enclosed for filing please find the above-referenced new patent application. Please indicate receipt of this application by returning the attached postcard with the official Patent and Trademark Office receipt and serial number stamped thereon.

Respectfully submitted,

Joffry W. Smith, Reg. No. 33455 Attorney for Applicant Lathrop & Clark P.O. Box 1507 Madison, Wisconsin 53701-1507 (608) 257-7766

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The undersigned hereby certifies that this 19.75,by the "Express Mail" service, utilizing express mail tabel number E-M16441184505 addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

W. SMITH TEXERY Name of Person signing 1 son mailing this document

#### PEDOMETER

Nathan Pyles Joel M. Macht Chen Shui-Jung

# FIELD AND BACKGROUND OF THE INVENTION

The present invention relates generally to pedometers having a waist mounted stride-counting device and transmitter, and a wrist-mounted receiver and display. The invention also relates to a distance calculation device that calculates a distance walked or run based on an algorithm that converts a base stride length and a base stride rate to an actual stride length for use in calculating the distance traveled.

Pedometers are known which include devices or algorithms for determining the distance a person travels on foot. For example, U.S. Patent 4,371,945 discloses an electronic pedometer that calculates distance by electronically measuring the length of each stride taken by a user. Stride length is measured by ultrasonic waves generated by an ultrasonic module strapped to one leg and an ultrasonic detector worn on the other leg. A program compensates for a variety of measurement errors and the results are displayed on a wrist-mounted display after being transmitted by VHF waves from the leg to the wrist.

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U.S. Patent 4,771,394 discloses a computer shoe with a heel-mounted electronic device with an inertia footstrike counter, a timer, a sound generating device, a battery, and a gate array for counting time and footstrikes to calculate distance and running time as a function of stride time. Although recognizing the important relationship of stride length and foot speed, the shoe in this patent requires data from at least 15 test runs or walks and the data must be user-entered in pairs of footstrikes and elapsed time to cover a pre-determined distance. Further, user adjustments of time must be performed to accommodate start and stop times, and the number of counted footstrikes is increased one percent to overcome inherent errors

in the inertia step counter. The shoe-mounted device is subject to damage from impact, dirt, and water, and requires a stay-at-home computer with which to interface. There is no means disclosed to transmit data to a wrist-mounted display device or an "on-board" computing device that provides "real time" data to a runner.

U.S. Patent 4,855,942 discloses a pedometer and calorie measuring device
that includes a wrist-mounted step counter and a fixed stride length to calculate
distance traveled. Wrist-mounted step counters are known to be inaccurate because
they assume a step for every arm movement. Even with error correction, such a
device will provide less accurate step counts than a leg or waist-mounted counter.
Further, fixed stride lengths do not take into account the fact that stride length varies
with rate of movement.

U.S. Patent 5,117,444 discloses a pedometer and calibration method with two calibration modes. First, a user travels a predetermined "half-distance" for the device to count and store the number of strides in that distance. Next, the user travels a second distance with the step counter comparing actual steps to the steps in memory and a current trip memory are incremented by a tenth of a "whole unit" distance. There is no correlation between stride length and stride rate which requires the user to re-calibrate the device when walking as opposed to running.

U.S. Patent 5,475,725 discloses a pulse meter with pedometer function to determine pace and pulse rate of a user. The meter uses pulse wave base data compared to actual pulse wave data rates.

U.S. Patent 5,476,427 discloses a pace display device utilizing a base rate for

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traveling pre-set distances in successive trails. The device calculates step counts and rates, and compares actual step count rates to display data to a user for comparison of present running rates to previous rates.

Thus, there is a need for a simple, but highly accurate, pedometer that displays distance traveled, pace, speed, heart rate, and other important information on

an easily read wrist-mounted device.

#### SUMMARY OF THE INVENTION

The present invention overcomes problems and shortcomings in the prior art by providing a device that includes a waist, chest, or leg-mounted stride counting device, a transmitter, and a wrist-mounted receiver/display device that provides highly accurate travel distances and other information. The device includes a computer that stores base stride length and rate data from traveling a pre-determined distance and compares that to actual stride rate data to calculate actual distance traveled, speed, and pace. The invention recognizes the interdependency of stride length and stride rate and uses that relationship to provide superior distancecalculating accuracy.

The invention also provides for improved display of relevant data on a wristmounted display that receives digital signals from devices worn on other body parts such as legs, waist, and chest. Transmitters that can send coded signals are desirable because they will not interfere with similar devices worn by other users in the vicinity.

The accuracy of the device is enhanced by the use of an algorithm that adjusts a base stride length based on actual stride rates. The algorithm is defined as: Actual Stride Length = Base Stride Length + Base Stride Length \*(((Actual Stride Rate -Base Stride Rate) N)/Base Stride Rate); where N is either an average value or a derived value from a plurality of samples.

The invention also includes a method for calculating an actual stride length including steps of: timing a first user run of a predetermined distance; counting the total number of strides in the user first run; dividing the first run distance by the stride count to obtain a base stride length; dividing the stride count by the first run time to obtain a base stride rate; counting strides during a user's second run to obtain an

actual stride rate; calculating the actual stride length using the formula: Actual Stride

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Length = Base Stride Length + Base Stride Length

\*(((Actual Stride Rate - Base Stride Rate )N)/Base Stride Rate); wherein N is an average value or a derived value.

The average value method can be refined by comparing Base Stride Rate to

Actual Stride Rate to determine a percentage difference; and using N=1 when the

Actual Stride Rate ≤ Base Stride Rate \* 1.02 and using N=3 when Actual Stride Rate
 > Base Stride Rate \* 1.02. A preferred embodiment uses a plurality of sample runs over known distances to derive an accurate N value for each individual.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic diagram of a pedometer in accordance with the present invention.

# DETAILED DESCRIPTION OF THE DRAWINGS

As illustrated in Fig. 1, the present invention is directed to an improved pedometer 20 including: a waist, chest, or leg mounted stride counter 24, and a wrist or waist mounted display unit 26. An optional chest-mounted heart monitor 28 can be included. All of the device components are mounted in suitable housings. The pedometer 20 includes a data processor 30 that is mounted in the same housing as either the step counter 24 or the display unit 26.

The step counter 24 is an inertia device that counts the number of steps a user takes. The number of steps is transmitted to a data archive 32 either directly or via a transmitter 34. The data archive 32 is mounted in the housing with the step counter 24 or the display 26.

The transmitter 34 is mounted in the step counter housing and is preferably an Rf telemetric signal transmitter with a 30 inches to 36 inches transmission range.

Alternately, the transmitter is a wireless or wired digital transmitter with a coding function to limit or eliminate interference with other similar devices. The wireless transmission range is set between 30 inches and 36 inches to provide adequate range to transmit signals from a user's waist to wrist, but not so far as to cause interference with other Rf or digital devices in the vicinity.

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The transmitter 34 transmits either raw data or calculated distances, pace, etc. to a wrist-mounted display unit receiver 40. The receiver 40 relays a raw data signal

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to the data processor 30 or a calculated data signal directly to the display panel 42, such as an LCD or LED.

Similarly, the heart rate monitor 28 includes a transmitter 44 that transmits heart rate data to the display unit 26. The heart monitor transmitter 44 can transmit at the same or a different frequency as the stride counter 24, and to the same or a

different receiver in the display unit 26. The heart rate transmitter 44 is preferably Rf, but can be digital for the reasons stated above. The range of the heart rate transmitter 44 should also be between 30 inches and 36 inches to ensure effective communication with the receiver while limiting outside interference.

The data processor 30 can also include a programmable logic controller, a personal computer, a programmable read-only memory, or other suitable processor. The data processor 30 includes a data archive 32 to store historic data on stride length and pace to be used in an algorithm for calculating actual distances, speed, and rate for real-time conversion of data to useful information for a user.

The data processor 30 can also include closed loop or fuzzy logic programming to continually or periodically replace the base stride rate and length with recently calculated stride rates and lengths so that long term conditioning trends are accommodated in the base stride archive. Incorporating trend capabilities may further enhance accuracy of the distance and pace calculations.

The display unit 26 also includes an operator interface 46 such as a key pad, button, knob, etc. that enables the user to start and stop a clock 48 (or stop watch) and activate various use modes within the pedometer, such as a sampling mode and operation mode.

One option for using the pedometer 20, requires the user to operate a "sampling mode" and begin walking or running a pre-determined distance such as a mile or 1600 meters, preferably on a running track of a known size. Upon completion of the distance, a stop button on the operator interface 46 is pushed. The data processor 30 is programmed to then divide the distance by the number of strides counted to calculate an average stride length. This value is stored in the data archive 32 as the "Base Stride Length."

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Also, the data processor 30 is programmed to divide the number of strides by

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the time of the run or walk as measured by the clock 48 to arrive at a "Base Stride Rate."

The data processor 30 preferably includes programming that queries the user about the distance to be run during the sampling mode. By providing options or enabling the use of any distance during the sampling mode, the pedometer 20 provides maximum flexibility for use by people of various physical conditions, or having access to courses of different known distances. Thus, a user may be queried to input a distance to be used in the sampling mode and then be given a list of options such as 400 meters, 440 yards, 1600 meters, or one mile, or be asked to simply input any distance known to the user that will be traveled during the sampling mode.

The present invention makes full use of the relationship between a faster rate of travel and longer stride lengths. In other words, the faster a user is moving, the longer will be the stride length. Over the course of the run or walk, the user's step rate and, therefore, stride length will change and the user will cover more ground when moving fast and less ground when moving slow.

Clearly, using a fixed average stride length in calculating distance traveled will result in errors using prior pedometers. This is particularly true if a user changes pace, or improves conditioning and speed to the point where the average stride length over a given run increases dramatically. The error compensators in prior devices do not adjust for changes in pace. With the old devices, a user needed to re-calibrate periodically to be close to getting an accurate reading, and could not change pace during a workout without decreasing accuracy.

To make the correction, the user activates a "Use Mode" in which the data processor 30 calculates an Actual Stride Rate based on data from the stride counter 24 and the clock 48. For example, an Actual Stride Rate can be calculated every five seconds without the user doing more than activating the "Use Mode" button, while all the calculations are performed by the data processor automatically. The percentage change between the Actual Stride Rate and the Base Stride Rate is then computed by the data processor 30 to determine an Actual Stride Length. Again, if the Actual Stride Rate is greater than the Base Stride Rate, the Actual Stride Length

is longer than the Base Stride Length. If the Actual Steps Per Second is lower than

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the Base Steps Per Second, the Actual Stride Length is shorter than the Base Stride Length. The algorithm below provides a means for comparing the Actual and Base Stride rates to arrive at an accurate Actual Stride Length.

First, a comparison between the Actual Stride Rate and the Base Stride Rate is made to determine whether Actual Stride Rate is less than or equal to Base Stride

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Rate multiplied by 1.02. Stride Length is calculated by:

Actual Stride Length = Base Stride Length +

Base Stride Length \*(((Actual Stride Rate - Base Stride Rate)N)/Base Stride Rate)

Where: N=1 when Actual Stride Rate is less than or equal to Base Stride Rate 10 multiplied by 1.02, and N=3 when Actual Stride Rate is greater than Base Stride Rate multiplied by 1.02, although other N values in the range of one to three can be used.

The above algorithm is accurate for heel to toe activities such as walking or jogging, but is less accurate for sprinting (toe only).

A third method of calculating actual stride length uses three separate run or walk samples at three different paces. This is the most accurate option. With this method, the N values are unique for each individual. By deriving an N value for each individual, this value more accurately reflects the actual change in stride length with a change in pace. After a proper warmup, the user completes a sample run or walk on the track at a normal pace. This first sample S1, will establish the Base Stride and the Base Steps Per Second.

S1 SAMPLE:

S1 Stride = Base Stride = Distance / Number of Steps

S1 Steps Per Second or S1 Steps Per Second = Base Steps Per Second =

Number of Steps Per Second 25

> Following completion of the first run or walk at normal pace, the user runs or walks the same course and the same distance at a faster run or walking pace, but not a sprinting pace. The user should not run on his toes, but maintain the normal heel to toe jogging style. This is the S2 sample. The purpose of the S2 sample is to calculate

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Second has on this individual's stride length. Some individual's steps will lengthen

an N2 value for each individual which reflects the effect an increase in Steps Per

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more than others as Steps Per Second increases, and by finding the value for N2, this relative increase can be quantified for a more accurate and customized algorithm for each individual.

S2 SAMPLE:

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To find the N2 value, which will be used by the algorithm when Actual Steps Per Second > Base Steps Per Second

N2 = ((S2 Stride \* S1 Steps Per Second) - (S1 Stride \* S1 Steps Per Second)) / (S1 Stride (S2 Steps Per Second - S1 Steps Per Second))

This value can be calculated since the distance is known, and both a Fast Stride Length (S2 Stride) and a Fast Steps Per Second (S2 Steps Per Second) can be calculated from the second sample.

Following completion of the fast run or walk, the user runs the same course and the same distance at a slower than normal run or walking pace. This pace cannot exceed the first sample pace. This is the S3 sample. The purpose of the S3 sample is to calculate an N3 value for each individual which reflects the effect a decrease in Steps Per Second has on this individual's stride length. Some individual's steps will shorten more than others as Steps Per Second decreases, and by finding the value for N3, this relative decrease can be quantified for a more accurate and customized algorithm for each individual.

20 S3 SAMPLE:

To find the N3 value, which will be used by the algorithm when Actual Steps Per Second < Base Steps Per Second.

N3=((S3 Stride \* S1 Steps Per Second) - (S1 Stride \* S1 Steps Per Second)) / (S1 Stride (S2 Steps Per Second - S1 Steps Per Second))

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This value can be calculated since the distance is known and both a "Slow" Stride Length (S3 Stride) and a "Slow" Steps Per Second (S3 Steps Per Second) can be calculated from the third sample.

Once these three samples are completed and the information automatically calculated and stored in the data processor 30, then the following formula can be used for the most accurate measurements of speed and distance.

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If: Actual Steps Per Second is less than or equal to Base Steps Per

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## Second

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Then:

Stride Length = Base Stride + Base Stride\*(((Actual Steps Per Second - Base Steps Per Second)N)/Base Steps Per Second)

And N = N3 (Stored Value)

If: Actual Steps Per Second > Base Steps Per Second

Then:

Stride Length = Base Stride + Base Stride\*(((Actual Steps Per Second - Base Steps Per Second)N)/Base Steps Per Second)

And N = N2 (Stored Value)

This third option for calculating stride length, and subsequently distance, speed, and pace, is a far more accurate method than a fixed stride length pedometer. This device and method are also practical, convenient, and has a relatively low manufacturing cost. If an individual's running or walking style is progressing with training and practice (as seen by significantly improved times), then it may be beneficial for them to recalibrate their device by repeating the three samples every 3 to 6 months. If there are no significant improvements in time, then recalibration is not necessary.

It is noted that any single stride length or pace discussed above can in fact be an average of a plurality of stride lengths or rates from test runs to further refine accuracy in the calculations of actual stride data.

Other variations on this device could also incorporate an altimeter which measures changes in elevation. The stride length could then be adjusted (shortened) when elevation is increasing, and lengthened when elevation is decreasing. This adjustment could be done with an average value, as we used in setting option 2, or with a derived value by running or walking over a known distance on a hilly course. This device can use two batteries so that the calibration data is not lost when the batteries are replaced one at a time.

Once the actual stride length is calculated for a given period of time, the value can be multiplied by the number of strides in that period to obtain a total distance for that period to be stored in a data archive file for that particular walk or run and added

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to other actual stride lengths or distances for other periods in which stride length was calculated. When the run or walk is completed, the user engages the operator interface 46 to indicate that a total distance is to be displayed on the display unit. Preferably, there is continual display of the distance traveled.

As a result of accurately calculating distance traveled, the pedometer 20 also has the capability of calculating speed in miles per hour, for example or pace in minutes per mile, including average speed and pace over the course of that particular walk or run. Further, the pedometer 20 can include a port for coupling to a separate personal computer or computing device to create larger training histories, trends, etc.

Additional features can include stop watches, day, date and time displays, as well as, heart rate displays as discussed above. Also, it will be understood that all distances and time periods used above can be varied in length and units of measure (English, metric, seconds, minutes, hours, etc.).

The foregoing detailed description is provided for clearness of understanding only and no unnecessary limitations therefrom should be read into the following claims.

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# CLAIMS /

	۵	1.	A pedometer comprising:	
		a step	counter mountable on a user first body portion;	
		a tran	smitter in communication with the step counter to generate a signal	1
	Б,	8	corresponding to each step and transmit the signal; and	(
		a rece	eiver mountable on a user second body portion to receive the signal	•
			transmitted from the transmitter and calculate a distance measured by	
			the step counter.	
		2.	The pedometer of claim 1, wherein the transmitter and the receiver	
	10	communicate	via wireless transmission.	
		3.	The pedometer of claim 1, wherein the transmitter and the receiver	
		communicate	via a wire.	
		4.	The pedometer of claim 1, wherein the transmission signal is digitally	
163) 1		coded.	1	
Sub	15	5.	The pedometer of claim 1, where in the transmitter transmits the	
A CO	$\left( \right)$	signal a wirel	ess distance in the range of thirty to thirty-six inches.	
N Q		6.	The pedometer of claim, wherein the receiver is mountable on a	
3		user's wrist.		
iouss		7.	The pedometer of claim 1, wherein the receiver processes the step	
ni Ni	20	count signal a	nd displays the distance traveled on a viewing screen.	
j,		8.	The pedometer of claim 1, wherein the step counter is mountable on a	
		user's leg.		
		9.	The pedometer of claim 1/and further comprising:	
		a hear	t rate monitor; and	
	25	a seco	nd transmitter in communication with the heart rate monitor to transmit	
			a signal corresponding to a heart rate calculated by the heart rate	
			monitor to the receiver and display the calculated heart rate.	
		10.	The pedometer of claim 9, wherein the heart rate signal is at a	
		different frequ	ency than the pedometer signal.	
	30	11.	The pedometer of claim 9, wherein the heart rate monitor is	
	30		The pedometer of claim 9, wherein the heart rate monitor is a user's third body portion.	

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Jub a2	*	12. The pedometer of claim 9, wherein the heart rate and the step counter transmitter are mounted in a single chest-mount housing. 13. The pedometer of claim 1, wherein the pedometer includes a data
Ø		processor programmed to calculate a distance traveled by multiplying the number of
/	5	strides taken by a stride length that varies according to the rate at which strides are
3 <del>-1803-19</del>		14. The pedometer of claim 13, wherein the data processor is
		programmed to calculate an actual stride length of a user by performing the steps of:
		timing a user first run of a predetermined distance;
	10	counting the total number of strides in the user first run;
		dividing the first run distance by the stride count to obtain a base stride length;
		dividing the stride count by the first run time to obtain a base stride rate;
		counting strides in a period of time during a user second run to obtain an
(1) (1)	15	actual stride rate
		calculating the actual stride length using the formula:
		Actual Stride Length = Base Stride Length + Base Stride Length
1.		*(((Actual Stride Rate - Base Stride Rate)N)/Base Stride Rate);
		3 where N is in the range of between 1 and 3.
[ <u>1</u> ] 177	20	No. The pedometer of claim $\sqrt{3}$ , wherein the pedometer is further
		programmed to perform the steps of:
		comparing the actual stride rate to the base stride rate; and
		calculating the actual stride length using N=1 when the actual stride rate is
		less than or equal to the base stride rate multiplied by 1.02.
	25	16. The pedometer of claim 18, wherein the pedometer is further
		programmed to perform the steps of:
		comparing the actual stride rate to the base stride rate; and
		calculating the actual stride length using N=3 when the actual stride rate is
		greater than the base stride rate multiplied by $1.02$ .

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luti	17.	A pedometer comprising:	t.
5000	<b>∖</b>	counter;	
-02/	a tran	smitter in communication with the step counter to generate a signal	
62		corresponding to each step and transmit the signal; and	
5	a rece	eiver mountable on a user body portion to receive the signal	
8	2	transmitted from the transmitter and calculate a distance measured by	
		the step counter, and	
	a data	processor programmed to calculate a distance traveled by multiplying	
		the number of strides taken by a stride length that varies according to	
10	L	the rate at which strides are taken.	
	<b>N</b> 8.	The pedometer of claim N, wherein the transmitter and the receiver	
	communicate	via wireless transmission.	
star Tursi	<b>N</b> 9.	The pedometer of claim $N$ , wherein the transmitter and the receiver	
120 	communicate	via a wire.	
0 8 15	. 20.	The pedometer of claim 17, wherein the transmission signal is digitally	R.
Juny >	coded.	O A	
	21,	The pedometer of claim 17, where in the transmitter transmits the	
E C	signal a wirel	ess distance in the range of thirty to thirty-six inches.	
	10.82	The pedometer of claim K, wherein the receiver is mountable on a	
20 10	user's wrist.		
	11 23	The pedometer of claim <b>N</b> , wherein the receiver processes the step	
	count signal a	and displays the distance traveled on a viewing screen.	
	12 12 84.	The pedometer of claim $\mathbf{N}$ , wherein the step counter is mountable on	
	a user's leg.	λ. 	
0 \$ 25	25.	The pedometer of claim 17, and further comprising:	
Jun 1	a hear	t rate monitor; and	
G <sup>2</sup>	a seco	and transmitter in communication with the heart rate monitor to transmit	
~ /		a signal corresponding to a heart rate calculated by the heart rate	
4		monitor to the receiver and display the calculated heart rate.	
30	26.	The pedometer of claim 25, wherein the heart rate signal is at a	
		uency than the pedometer signal.	

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	27.	The pedometer of claim 25, wherein the heart rate monitor is
	mountable to	a user's third body portion.
Subob	28.	The pedometer of chim 25, wherein the heart rate and the step
S 07	counter are m	nounted in a single mest-mount housing.
5	1729	The pedometer of claim N, wherein the data processor is
•	programmed	to calculate an the distance traveled actual stride length of a user by
	performing th	e steps of:
	timing	g a user first run of a predetermined distance;
	count	ing the total number of strides in the user first run;
10	dividi	ng the first run distance by the stride count to obtain a base stride
		length;
	dividi	ng the stride count by the first run time to obtain a base stride rate;
	count	ing strides in a period of time during a user second run to obtain an
		actual stride rate;
15	calcul	ating the actual stride length using the formula:
		Actual Stride Length = Base Stride Length + Base Stride Length
		*(((Actual Stride Rate - Base Stride Rate)N)/Base Stride Rate);
	18	where N is in the range of between 1 and 3.
	. 30.	The pedometer of claim N, wherein the pedometer is further
20	programmed	to perform the steps of:
	compa	aring the actual stride rate to the base stride rate; and
	calcul	ating the actual stride length using N=1 when the actual stride rate is
	19	less than or equal to the base stride rate multiplied by 1.02.
	\$1.	The pedometer of claim $\mathbf{N}$ , wherein the pedometer is further
25	programmed	to perform the steps of:
	compa	aring the actual stride rate to the base stride rate; and
	calcula	ating the actual stride length using N=3 when the actual stride rate is
		greater than the base stride rate multiplied by 1.02.
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A pedometer programmed to calculate an actual stride length of a user 32. by performing the steps of: timing a user first run of a predetermined distance; counting the total number of strides in the user first run; dividing the first run distance/by the stride count to obtain a base stride length; dividing the stride count by the first run time to obtain a base stride rate; counting strides in a period of time during a user second run to obtain an actual stride rate; calculating the actual stride length using the formula: 10 Actual Stride Length = Base Stride Length + Base Stride Length \*(((Actual Stride Rate - Base Stride Rate)N)/Base Stride Rate); where N/is in the range of between 1 and 3. The pedometer of claim 32, wherein the pedometer is further 83 programmed to perform the steps of: 15 comparing the actual stride rate to the base stride rate; and calculating the actual stride length using N=1 when the actual stride rate is less than or equal to the base stride rate multiplied by 1.02. 22 The pedometer of claim 32, wherein the pedometer is further programmed to perform the steps of: 20 comparing the actual stride rate to the base stride rate; and calculating the actual stride length using N=3 when the actual stride rate is greater than the base stride rate multiplied by 1.02. 35. The pedometer of claim 32, wherein the receiver processes the step count signal and displays the distance traveled on a viewing screen. 36. The pedometer of claim 22, and further comprising a heart rate monitor mounted in a chest-mount housing.

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37. A pedometer programmed to calculate an actual stride length of a user by performing the steps of: timing a user first run of a predetermined distance; counting the total number of strides in the user first run; dividing the first run distance by the stride count to obtain a first run base stride length; dividing the first run stride count by the first run time to obtain a first run base stride rate; timing a user second run of a predetermined distance; counting the total number of strides in the user second run; 10 dividing the second run distance by the second run/stride count to obtain a second base stride length; dividing the second run stride count by the second run time to obtain a second base stride rate; timing a user third run of a predetermined/distance; 15 counting the total number of strides in the user third run; dividing the third run distance by the third run stride count to obtain a third base stride length; dividing the third run stride count/by the third run time to obtain a third run base stride rate; 20 counting strides in a period of time during a user fourth run to obtain an actual stride rate; calculating the actual stride length using the formula: Actual Stride Length = Base Stride Length + Base Stride Length \*(((Actual Stride Rate - Base Stride Rate)N)/Base Stride Rate); 25 where N is calculated by the formula ((Second Run Stride Length multiplied by First Run Stride Rate) - (First Run Stride Length multiplied by First Run Stride Rate)) / (First Run Stride Length multiplied by (Second Run Stride Rate - First Run Stride Rate)) when the Actual Stride Rate is greater than the First Run Stride Rate, and 30 where N is calculated by the formula ((Third Run Stride Length 16

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multiplied by First Run Stride Rate) - (First Run Stride Length multiplied by First Run Stride Rate)) / (First Run Stride Length multiplied by (Third Run Stride Rate - First Run Stride Rate)) when the Actual Stride Rate is less than or equal to the First Run Stride

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The pedometer of claim  $\mathfrak{N}$ , wherein:

the first run base stride length is an average stride length calculated from a plurality of test runs; and

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the first run base stride rate is an average base stride rate calculated from the

27 plurality of test runs.

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SQ. The pedometer of claim SJ, wherein:

the second run base stride length is an average stride length calculated from a plurality of test runs; and

the second run base stride rate is an average base stride rate calculated from

27 the plurality of test runs. 25

 $\mathbf{W}$ . The pedometer of claim  $\mathbf{\widetilde{N}}$ , wherein:

the third run base stride length is an average stride length calculated from a plurality of test runs; and

the third run base stride rate is an average base stride rate calculated from the

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plurality of test runs. The pedometer of claim \$3, wherein the second run is at a faster pace

than the first walk or run and the third run is at a slower pace than the first walk or

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42. The pedometer of claim  $\mathfrak{N}$ , and further comprising:

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a data processor mountable on a user body portion to calculate the actual stride length; and

a run data display device in communication with the data processor and

3 mountable on a user body portion.

43. The pedometer of claim  $\overline{N}$ , and further comprising a heart rate monitor mounted in a chest-mount housing.



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44. A method for calculating an actual stride length comprising the steps

timing a first user run of a predetermined distance;

counting a total number of strides in the user first run;

dividing the first run time by the stride count to obtain a Base Stride Length; dividing the stride count by the first run time to obtain a Base Stride Rate; counting strides in a pre-determined period during a user second run to obtain an Actual Stride Rate;

calculating the actual stride length using the formula:

Actual Stride/Length= Base Stride Length + Base Stride Length \*(((Actual/Stride Rate - Base Stride Rate)N)/Base Stride Rate);

33 wherein/N is between one and three.

**45**. The method of claim **44** and further comprising the steps of comparing Base Stride Rate to Actual Stride Rate to determine a percentage difference; and using N=1 when the difference is less than two percent and using N=3 when the difference is greater than or equal to two percent.

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# ABSTRACT OF THE DISCLOSURE

The pedometer having improved accuracy by calculating actual stride lengths of a user based on relative stride rates. The pedometer includes a waist or leg mounted stride counter, a transmitter for transmitting data to a wrist-mounted display unit, and a data processor for calculating necessary base units and actual stride rates

and lengths. The pedometer can also interact with a heart monitoring device.

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#### Docket No .: EPIXINC-4

## DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: PEDOMETER, the specification of which

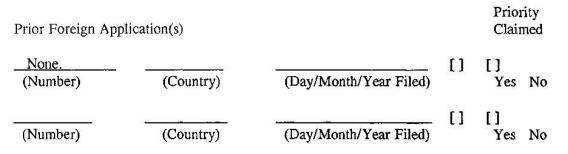
[X] is attached hereto.

 [] was filed on \_\_\_\_\_\_ as Application No. \_\_\_\_\_\_ and was amended on \_\_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I do not know and do not believe that the same was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application, that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a), and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows: None.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:



I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

 (Application	(filing date)	(Statuspatented,
Serial Number)		pending, abandoned)
(Application Serial Number)	(filing date)	(Statuspatented, pending, abandoned)

And I hereby appoint the practitioners associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Customer Number:

Customer Number: 020,455

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

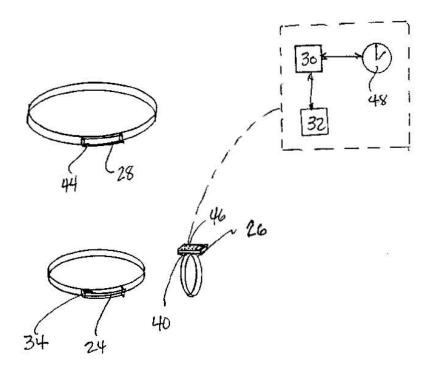
Full name of sole Inventor Nathan Pyles Inventor's Signature Date Residence Lake Mills, Wisconsin Citizenship United States of America 529 College Street, Lake Mills, Post Office Address Wisconsin 53551 Full name of sole Inventor Joel M. Macht Inventor's Signature Date Residence Reeceville, Wisconsin United States of America Citizenship Post Office Address 106 North Avenue, Reeceville, Wisconsin 53579

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# Full name of sole Inventor Chen Shui-Jung

Inventor's Signature

Date Taipei, Taiwan Residence Citizenship Republic of China 2 F No. 349, Wu Shin Street, Taipei, Post Office Address Taiwan



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I hereby certify that this corre class mail in an envelope add this date:						
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PTO/SB/17 (12-97)

Approved for use through 09/30/00. OMB 0651-0032
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
Complete if Known
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#### Patent Application IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicant:Pyles et al.Date:May 4, 1999Date Filed:October 28, 1998Docket No.:EPIXINC-4Application Number:09/181,738Art Unit:2816

For:

PEDOMETER

Certificate of Mailing
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Attention: Box Missing Parts Assistant Commissioner for Patents, Washington, D.C. 20231
on May 4, 1999 Date
John W. Smith Signature
Jeffry W. Smith, Reg. No. 33455 Name of applicant, assignee or Registered Representative

TRANSMITTAL OF MISSING PARTS OF APPLICATION UNDER 37 C.F.R. §1.53

Attention: Box Missing Parts Assistant Commissioner for Patents Washington, D.C. 20231

Dear Sir:

In response to the Notice of Missing Parts mailed November 17,1998, enclosed are the following items for filing in the above-referenced U.S. Patent application:

1. A Declaration and Power of Attorney, executed by the applicant on March 21,

4.

Applicant: Nathan Pyles Application No.: 09/181,738 Art Unit: 2816

1999; May 3, 1999; and May 3, 1999.

2. Form PTO-1533 Notice to File Missing Parts.

3. A check in the amount of \$500.00 to cover the filing fee (37 C.F.R. §1.16(a) et seq.), the surcharge set forth in 37 C.F.R. §1.16(e), and extension of time under 37 CFR 1.136(a).

4. Verified Statement Claiming Small Entity Status--Small Business Concern, executed on March 21, 1999.

5. Petition for Extension of Time Under 37 CFR 1.136(a).

The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 15-0660. A duplicate copy of this document is enclosed.

Having now complied with all of the requirements of 37 C.F.R. §1.53, applicant respectfully requests that this application be placed upon the files for examination.

Respectfully submitted,

H Jeffry W. Smith, Reg. No. 33455

Jeffry W. Smith, Reg. No. 33455 Attorney for Applicant Lathrop & Clark LLP 740 Regent Street, Suite 400 P.O. Box 1507 Madison, Wisconsin 53701-1507 (608) 257-7766

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ç	Patent Application IN THE UNITED S	TATESPATENT	I AND TRADI	EMARK OFFICE
Applicant:	Pyles et al.	MAN 10 TOM	Date:	May 4, 1999
Date Filed:		MAT TO TRADEMAN	Docket No.:	EPIXINC-4
Application N	Number: 09/181,738	A TRADER	Art Unit:	2816

For:

PEDOMETER

Certificate of Mailing
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Attention: Box Missing Parts Assistant Commissioner for Patents, Washington, D.C. 20231
on May 4, 1999 Date
Approv. Smith
Jeffry W. Smith, Reg. No. 33455
Name of applicant, assignee or Registered Representative

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Jeffry W. Smith, Reg. No. 33455 Attorney for Applicant Lathrop & Clark LLP 740 Regent Street, Suite 400 P.O. Box 1507 Madison, Wisconsin 53701-1507 (608) 257-7766

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#### Docket No.: EPIXINC-4

## DECLARATION AND POWER OF ATTORNEY

a below named inventor, I hereby declare that:

In My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: PEDOMETER, the specification of which

[ ] is attached hereto.

[X] was filed on <u>October 28, 1998 as Application No. 09/181,738</u> and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I do not know and do not believe that the same was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application, that I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a), and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows: None.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign App	lication(s)	*		Priority Claimed
None. (Number)	(Country)	(Day/Month/Year Filed)	[]	[] Yes No
(Number)	(Country)	(Day/Month/Year Filed)	[]	[] Yes No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

None.		
(Application	(filing date)	(Statuspatented,
Serial Number)		pending, abandoned)
(Application	(filing date)	(Statuspatented,

And I hereby appoint the practitioners associated with the Customer Number provided below to prosecute this application and to transact all business in the Ratent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Customer Number:

pending, abandoned)

Customer Number: 020,455

Serial Number)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Nathan Pyles

Full name of sole Inventor

Inventor's Signature

Date Residence Citizenship Post Office Address

Lake Mills, Wisconsin United States of America 529 College Street, Lake Mills, Wisconsin 53551

Full name of sole Inventor

Joel M. Macht

Inventor's Signature

ford M. Mas

Date Residence Citizenship Post Office Address 5-3-99 Reegeville, Wisconsin United States of America 106 North Avenue, Reeceville, Wisconsin 53579

Full name of sole Inventor

Chen Shui-Jung

Inventor's Signature

Alton Cm-Jung 

Date Residence Citizenship Post Office Address

Taipei, Taiwan Republic of China 2 F No. 349, Wu Shin Street, Taipei, Taiwan

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	TEMENT CLAIMING SMALL ENTITY S 7(c))-SMALL BUSINESS CONCERN	STATUS (32 GER 1.9(	) & Docket Number (Optional) EPIXINC-4
App	icant, Patentee, or Identifier: Nathan Pyles	1 5	
Appl	ication or Patent No.: 09/181,738	MAY 1 0 1999 @	
	l or Issued: October 28, 1998		
	eby state that I am	RADEMARK	
Ü	the owner of the small business concern identi	fied below:	
X	an official of the small business concern empo	wered to act on behalf of th	e concern identified below:
NAM	TE OF SMALL BUSINESS CONCERN Epix, Inc.	11111111111111111111111111111111111111	
ADD	RESS OF SMALL BUSINESS CONCERN 621 [	D East Lake Street, Lake Mi	ls, Wisconsin 53551
num state conc year	I hereby state that the above identified small to FR Part 121 for purposes of paying reduced fee ber of employees of the concern, including those ement, (1) the number of employees of the busin ern of the persons employed on a full-time, part , and (2) concerns are affiliates of each other where to control the other, or a third party or parties	es to the United States Pate e of its affiliates, does not e ness concern is the average t-time, or temporary basis d hen either, directly or indirec	nt and Trademark Office, in that the sceed 500 persons. For purposes of this over the previous fiscal year of the uring each of the pay periods of the fiscal tly, one concern controls or has the
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$\boxtimes$	the specification filed herewith with title as liste	ed above.	
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to th 37 C	If the rights held by the above identified small nization having rights in the invention must file s e invention are held by any person, other than th FR 1.9(c) if that person made the invention, or I er 37 CFR 1.9(d), or a nonprofit organization und	separate statements as to the he inventor, who would not of by any concern which would	eir status as small entities, and no rights qualify as an independent inventor under
	Each person, concern, or organization having	any rights in the invention i	s listed below:
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stati	Separate statements are required from each r ng their status as small entities (37 CFR 1.27).	named person, concern or o	rganization having rights to the invention
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	atent and Trademark Office; U.S. Di In Act of 1995, no persons are requir d OMB control number.	
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	Group Art Unit 2816	Examiner
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200 UNITED STATES DEPARTMENT OF COMMERCE Patent and Trademark Office Address: COMMISSIONER OF PATENTS AND TRADEMARKS 1000 Washington, D.C. 20231 FILING/RECEIPT DATE FIRST NAMED APPLICANT ATTORNEY DOCKET NO./TITLE LICATION NUMBER PYLES EF1XINC-d 10/28/98 097181.738 mong Part Dea 020485 0242/1117 LATHROP CLARK NOT ASSISNED 122 W WASHINGTON AVENUE P 0 BOX 1507 Ulk 11/2:112:0816 NATESON WE SERVED DATE MAILED: 11/17/98 NOTICE TO FILE MISSING PARTS OF APPLICATION Filing Date Granted An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay fees required below to avoid bandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR (136(a). If any of items 1 or 3 through 5 are indicated as missing, the SURCHARGE set forth in 37 CFR 1.16(e) of \$65.00 for a small entity in compliance with 37 CFR 1.27, or \$330.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment. If all required items on this form are filed within the period set above, the total amount owed by applicant as a  $\Box$  small entity (statement filed)  $\Box$  non-small entity is  $\frac{2}{3}$ 1. The statutory basic filing fee is: missing.
 insufficient. Applicant must submit \$ \_\_\_\_\_ such status (37 CFR 1.27). to complete the basic filing fee and/or file a small entity statement claiming , including any multiple dependent claim fees, are required. 2. Additional claim fees of \$ independent claims over 3. for and a state of the second dependent claims over 20. for for multiple dependent claim surcharge. Applicant must-either submit the additional claim fees or cancel additional claims for which fees are due. The oath or declaration: G 3. is missing or unexecuted. does noticover the newly submitted items. Z does not identify the application to which it applies. does not include the city and state or foreign country of applicant's residence. An oath or declaration in compliance with 37 CFR 1. 63, including residence information and identifying the application by the above Application Number and Filing Date is required. 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47. A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required. □ 5. The signature of the following joint inventor(s) is missing from the oath or declaration: An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required. 22 🗋 6. A \$50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)). ន់ស្ល 09181738 7. Your filing receipt was mailed in error because your check was returned without payment. 8. The application does not comply with the Sequence Rules. See attached "Notice to Comply with Sequence Aules 37 CFR 1.821-1.825." 00000053 9. OTHER: Direct the reply and any questions about this notice to "Attention: Box Missing Parts." A copy of this notice MUST be returned with the reply. TIKANI Customer Service Center 12/1999 Initial Patent Examination Division (703) 308-1202 FC:205 PART 2 - COPY TO BE RETURNED WITH RESPONSE 1.1 FORM PTO-1533 (REV.9-97) 294 2.14 1

	number.		Application Number	09/181,738			
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	Typed or printed name	Jeffrv V	V. Smith, Reg.	No. 33455			
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PTO/SB/21 (12-97)

## PATENT APPLICATION

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Pyles, et al.	Date:	February 16, 1999
Filed:	October 28, 1998	Docket No.:	EPIXINC-4
Application No.:	09/181,738	Art Unit:	2816
For:	PEDOMETER		

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1999 m 14 Date

*Jeffry W. Smith, Reg. No. 33455* Name of applicant, assignee or Registered Representative

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Assistant Commissioner for Patents Washington, D.C. 20231

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Dear Sir:

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1 8 1999

In accordance with 37 C.F.R. §1.56, applicant wishes to call the attention of the Examiner to the following documents:

## United States Patents

U.S. Patent No.	Issue Date	Patentee
4,053,755	10-11-1977	Sherrill
4,223,211	09-16-1980	Allsen et al.
4,334,190	06-08-1982	Sochaczevski
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5,516,334	05-14-1996	Easton
5,526,290	06-11-1996	Kanzaki

Copies of these documents are submitted herewith along with Form PTO-SB/08A.

Applicant respectfully requests that these documents be expressly considered during the prosecution of this application and made of record herein and appear among the "documents cited" on any patent to issue herefrom.

## Respectfully submitted,

By: Juffu W. Smith, Reg. No. 33455

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Jeffry W. Swith, Reg. No. 334: Attorney for Applicant Lathrop & Clark LLP 740 Regent Street, Suite 400 P. O. Box 1507 Madison, Wisconsin 53701 (608) 257-7766

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PTO/SB/08A (10-96) oved for use through 10/31/99. OMB 0651-0031

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<sup>1</sup>Unique citation designation number. <sup>2</sup>See attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard St.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>4</sup>Applicant is to place a check mark here if English language Translation is attached.

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PATENT APPLICATION

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Pyles, et al.	Date:	December 17, 1999
Filed:	October 28, 1998	Docket No.:	EPIXINC-4
Application No.:	09/181,738	Art Unit:	2816
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Signature Jeffry W. Smith, Reg. No. 33455 Name of applicant, assignee or Registered Representative

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## SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents Washington, D.C. 20231

Dear Sir:

In accordance with 37 C.F.R. §1.56, Applicants wish to call the attention of the Examiner to the following document:



A copy of this document is submitted herewith along with Form PTO/SB08A.

It is believed that no fee is owed for this disclosure under 37 C.F.R. 1.97(b)(3), because Applicants have not received and are not aware of a mailed office action on the merits.

If an action was mailed prior to the filing date hereof, the information disclosed herein is submitted after the mailing of a first office action and before the mailing of a final action. Thus, Applicants note, under 37 C.F.R. \$1.97(e)(2), that no item of information disclosed herein was cited by a foreign patent office in a counterpart application, and to the knowledge of the undersigned after making a reasonable inquiry, no item of information contained herein was known to any individual designated in \$1.56(c) more than three months prior to the filing of this information disclosure statement. Thus, it is believed no fee is owed for this filing. Nonetheless, if a fee is owed, the Office is hereby authorized to charge Account No. 15-0660. A duplicate copy of this document is enclosed.

Applicants respectfully request that this document be expressly considered during the prosecution of this application and made of record herein and appear among the "documents cited" on any patent to issue herefrom.

Respectfully submitted,

By

Jeffry W. Schith, Reg. No. 33455 Attorney for Applicant Lathrop & Clark LLP 740 Regent Street, Suite 400 P. O. Box 1507 Madison, Wisconsin 53701 (608) 257-7766

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Pyles, et al.	Date:	December 17, 1999
Filed:	October 28, 1998	Docket No.:	EPIXINC-4
Application No.:	09/181,738	Art Unit:	2816
For:	PEDOMETER	Examiner:	

## **Certificate of Mailing**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231

ecember 1999 on Date Signature Jeffry W Smith, Reg. No. 33455 Name of applicant, assignee or Registered Representative

## SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

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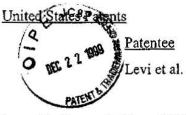
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Assistant Commissioner for Patents Washington, D.C. 20231

Dear Sir:

In accordance with 37 C.F.R. §1.56, Applicants wish to call the attention of the Examiner to the following document:

<u>U.S. Patent No.</u> <u>Issue Date</u> 5,583,776 12-10-1996



A copy of this document is submitted herewith along with Form PTO/SB08A.

It is believed that no fee is owed for this disclosure under 37 C.F.R. 1.97(b)(3), because Applicants have not received and are not aware of a mailed office action on the merits.

If an action was mailed prior to the filing date hereof, the information disclosed herein is submitted after the mailing of a first office action and before the mailing of a final action. Thus, Applicants note, under 37 C.F.R. \$1.97(e)(2), that no item of information disclosed herein was cited by a foreign patent office in a counterpart application, and to the knowledge of the undersigned after making a reasonable inquiry, no item of information contained herein was known to any individual designated in \$1.56(c) more than three months prior to the filing of this information disclosure statement. Thus, it is believed no fee is owed for this filing. Nonetheless, if a fee is owed, the Office is hereby authorized to charge Account No. 15-0660. A duplicate copy of this document is enclosed.

Applicants respectfully request that this document be expressly considered during the prosecution of this application and made of record herein and appear among the "documents cited" on any patent to issue herefrom.

Respectfully submitted,

Jeffry W. Smith, Reg. No. 33455 Attorney for Applicant Lathrop & Clark LLP 740 Regent Street, Suite 400 P. O. Box 1507 Madison, Wisconsin 53701 (608) 257-7766

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PTO/SB/08A (10-96) Approv : use through 10/31/99, OMB 0651-0031

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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Unique citation designation number. <sup>2</sup>See attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard St.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

PTO-90C (Rev. 2/95)

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U.S. G.P.O. 1999 460-693

	Application No. 09/181,738	Applicant(s)	Pyles	
Office Action Summary	Examiner Margaret Wa	mbach	Group Art Unit 2816	
Responsive to communication(s) filed on				
This action is <b>FINAL</b> .				
Since this application is in condition for allowance in accordance with the practice under <i>Ex parte Qu</i> .		2.67.553	n as to the mer	its is closed
A shortened statutory period for response to this action is longer, from the mailing date of this communication application to become abandoned. (35 U.S.C. § 133) 37 CFR 1.136(a).	. Failure to respond with	nin the period	for response v	vill cause the
Disposition of Claims				
X Claim(s) 1-45		is/are (	pending in the a	pplication.
Of the above, claim(s)		is/are w	ithdrawn from c	onsideration.
Claim(s)		is	are allowed.	
X Claim(s) <u>1-45</u>		is	are rejected.	
Claim(s)	is	are objected to	) <b>.</b>	
Claims				
<ul> <li>The specification is objected to by the Examiner</li> <li>The oath or declaration is objected to by the Ex</li> <li>Priority under 35 U.S.C. § 119</li> <li>Acknowledgement is made of a claim for foreig</li> <li>All Some* None of the CERTIFIED</li> </ul>	aminer. In priority under 35 U.S.(			
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SEE OFFICE AC	TION ON THE FOLLOWING	PAGES		
S. Patent and Trademark Office *0-326 (Rev. 9-95) Offi	ice Action Summary		Part of	Paper No. 6

#### Application/Control Number: 09/181738

Art Unit: 2816

## DETAILED ACTION

#### Claim Rejections - 35 USC § 112

#### 1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are replete with terms which lack a clear antecedent basis. Numerous instances of this problem will be specifically pointed out; however, applicant is required to proofread and correct all instances.

In claims 4, 20"the transmission signal", in claim 7, 23 "the step count signal", in claims 10, 26, "the heart rate signal" and "the pedometer signal", in claims 12, 28, "the heart rate" and "the step counter", in claim 17, "the number of strides" and "the rate", claim 32, "the total number of strides", "the stride count" and "the first run time", claim 35, "the receiver", "the step count signal" and "the distance", claim 37, "the total number of strides", "the first run distance", "the stride count" in stride count", "the first run time" and "the First Run Stride Rate" (all of the problems of claim 37 are repeated with regard to the second - fourth run), and claim 44, "the user first run", "the first run time" and "the stride count" lack a clear antecedent basis.

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Application/Control Number: 09/181738

Page 3

Art Unit: 2816

Also in claim 12, applicant's intended meaning cannot be discerned from the references of "the heart rate" which is located in a housing.

#### Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1, 3, 4, 6, 7, 9, 10 and 11 are rejected under 35 U.S.C. 102(a) as being anticipated by Sham et al..

Sham teaches a pedometer including a step counter (32), a transmitter (the wiring between 32 and 34) which transmits a digitally coded step signal and a receiver (30), referring to Figure 3. It is inherent that the receiver is "mountable" to a second body portion insofar as the term itself only means that it is possible to mount the receiver elsewhere. Secondly, the term "body portion" is so broad that the limitation is met merely by having the receiver and transmitter at different locations within the same housing (therefor affixed to different body portions.)

Moreover, Sham discloses a wrist watch arrangement on column 3, lines 43-45 as recited in claim 6. Sham discloses a processor and viewing screen (34 and 18) as recited in claim 7. As recited in claim 9, a heart rate monitor and a second transmitter (10 and 31) are also taught. Insofar as the heart rate signal is a wireless signal and the pedometer signal, assuming applicant Application/Control Number: 09/181738 Art Unit: 2816

means the signal from the step counter, is from a wire, these signals would inherently be of different frequencies, as recited in claim 10. The heart rate monitor is mounted to the user's chest

and thus, claim 11 is also met.

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## Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sham et

al..

The difference between Sham and claims 2 and 8 lies in the substitution of a wireless transmitter for a wire and a leg band for an arm or waist band. The first difference is not of patentable merit because the use of wireless transmitters is widespread in the art. Insofar as Sham does in fact employ a wireless transmitter for the heart monitor, and Sham would have the motivation of reducing the weight of box 14 by locating the step counter at a remote location, the motivation exists to employ that a wireless transmitter for the step counter. In terms of the leg band, it is merely commonsensical that anything which could be strapped to an arm or waist could also be strapped to a leg. In fact, Sham clearly wishes to leave the designer the latitude to make

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Page 4

#### Application/Control Number: 09/181738

Page 5

# Art Unit: 2816

such decisions because of the statement on column 3, line 44 that the device could be secured "in other ways."

#### Allowable Subject Matter

7. Claims 5, 12-16, 18-31, 33-36, 38-43 and 45 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

8. Claims 17, 32, 37 and 44 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, set forth in this Office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Wambach whose telephone number is (703) 308-4875. The examiner can normally be reached on Monday-Thursday from 6:30 to 5p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Callahan, can be reached on (703) 308-4876. The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Margaethoutvarter

Margaret R. Wambach Primary Examiner

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U. S. Patent and Trademark Office PTO-892 (Rev. 9-95)

Notice of References Cited

Part of Paper No. \_\_\_\_6

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U.S. DEPARTMENT OF COMMERCE - Patent and Trademark Office

Form PTO 948 (Rev. 8-98)

18173 Application No

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#### 1. Correction of Informalities--37 CFR 1.85

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File new drawings with the changes incorporated therein. The application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application, should be placed on the back of each sheet of drawings in accordance with 37 GFR 1.84(c). Applicant may delay filing of the new drawings until receipt of the Notice of Allowability (PTOL-37). Extensions of time may be obtained under the provisions of 37 CFR 1.136. The drawing should be filed as a separate paper with a transmittal letter addressed to the Drawing Processing Branch. entre (12,100) 100 het begen (1,000) 100 het het begen (12,000)

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2. Timing for Corrections

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section of Applicant is required to submit acceptable corrected drawings within the three-month shortened statutory period set in the Notice of Allowability (PTOL-37). If a correction is determined to be unacceptable by the Office, applicant must arrange to have acceptable corrections resubmitted within the original three-month period to avoid the necessity of obtaining an extension of time and paying the extension fee. Therefore, applicant should file corrected drawings as soon a possible. laith a shio (fair a chairle) Singhairtha (fi

Failure to take corrective action within set (or extended) period will result in ABANDONMENT of the Application. a a secondad de la sec

3. Corrections other than Informalities Noted by the Drawing Review Branch on the Form PTO-948

All changes to the drawings, other than informalities noted by the Drawing Review Branch, MUST be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes. l gradina da series. Se de se series de series de se series de se series de series de series de series de series de series de series \* 42.0 • • • • • No an inte

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(To be used for all correspondence after	(To be used for all correspondence ofter initial filing)		M.	Wambach				
Total Number of Pages in This Submission		Attomey Pocher Numbe		XINC-4				
Fee Transmittal Form	Assignment (For an Appl	Payers ication) MAR 2.1	2000	<ul> <li>25587</li> </ul>	ter Allowance Communication To			
Fee Attached	Drawing(s)	PATENT & TR	anessant Cr		ppeal Communication to Board Of peals and Interferences			
After Final	20	ting Slip (PTO/SB/69)			opeal Communication to Group opeal Notice, Brief, Reply Brief)			
Affidavits/declaration(s)		a Provisional Applicatio	n	<u></u>	oprietary Information			
Extension of Time Request		omey, Revocation prespondence Address		132.52	ditional Enclosure(s) case identify below):			
Express Abandonment Request	Terminal Dis			ĺ				
Information Disclosure Statement	Small Entity				PTO/SB 08b with 2 documents			
Certified Copy of Priority Document(s)					(12) (1			
Response to Missing Parts/ Incomplete Application	Remarks							
Response to Missing Parts Under 37 CFR 1.52 or 1.53	SICNATURE OF A	DDI IČANT ATTODNE	V OP ACENT	20				
Firm or Individual name	SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT							
Firm or Individual name Leffry W. Smith, Reg. No. 33455								
Date	MW Smi		19	aller i				
/V(8	ich 15,200	2	-	***				
I hereby certify that this correspondence is being deposit Assistant Commissioner for Patents, Washington, D.C. 2	ed with the United States	TIFICATE OF MAILING Postal Service as first class		lope address	ed to:			
Typed or printed name	Jeffry W.S	mith, Reg. No. 1	33455					
Signature	then 1. S	H.		Date	March 15, 2000			
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