

Economic Round Table
The California Club
Los Angeles, California, USA

“About Face!”

May 2, 2013

By

Robert M L Baker, Jr.

(Slide #1)



Thank you and good morning! Yes, my talk is entitled “About Face!”

But first allow me to preface my talk by quoting a favorite passage of mine from a rather famous Book [Slide #2](#)

Storm Over Lake Geneva

“IT WAS ON A STORMY NIGHT OF NOVEMBER OFF LAKE GENEVA THAT I BEHELD THE ACCOMPLISHMENT OF MY TOILS. WITH AN ANXIETY THAT ALMOST AMOUNTED TO AGONY, I COLLECTED THE INSTRUMENTS OF LIFE AROUND ME THAT I MIGHT INFUSE A SPARK OF BEING INTO THE LIFELESS THING THAT LAY AT MY FEET (THROUGH THE TWO ELECTRODES IN HIS HEAD TO INTRODUCE THE ELECTRICITY). IT WAS ALREADY ONE IN THE MORNING; THE RAIN PATTERNED DISMALLY AGAINST THE PANES, AND MY CANDLE WAS NEARLY BURNT OUT, WHEN, BY THE GLIMMER OF THE HALF-EXTINGUISHED LIGHT, I SAW THE DULL YELLOW EYES OF THE CREATURE OPEN; IT BREATHED HARD, AND A CONVULSIVE MOTION AGITATED ITS LIMBS.’ SO THEN AROSE FRANKENSTEIN’S MONSTER!

Slide #3

Frankenstein's Monster

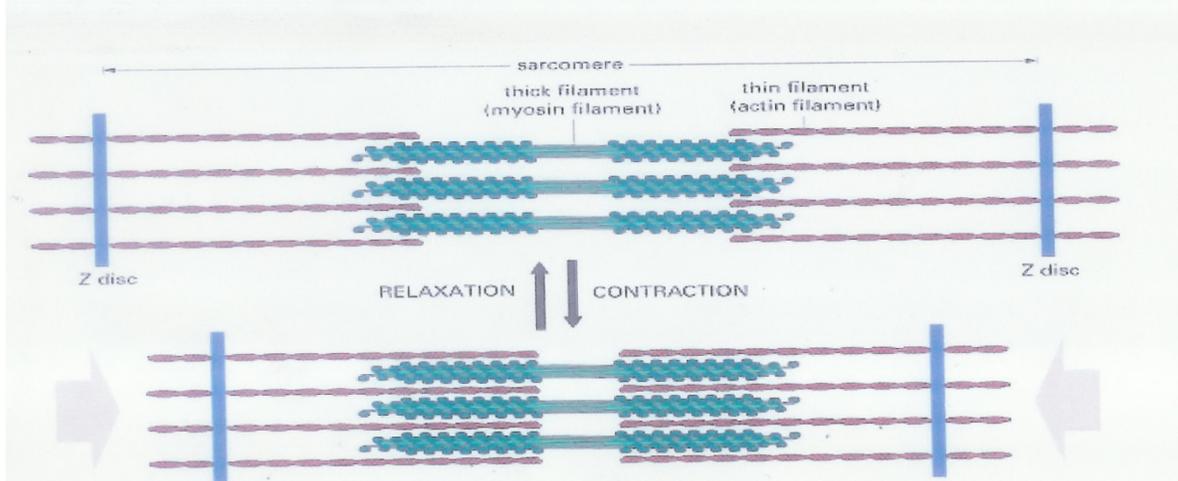


The author, Mary Shelly, had conversations at the Villa Diodata during a storm over Lake Geneva during the summer of 1818. While watching the lightening the conversations turned to the process of galvanism and experiments with electric shocks that made the muscles in a dead frog's legs twitch. This effect planted a

seed in her head that grew into a dream she had and then into her famous book about Doctor Victor Frankenstein's Monster.

In late 2003, I was undergoing my usual skin inspection by my dermatologist, Dr. Larry Moy, Much to the chagrin of his nursing staff my appointments took much too long since we often digressed from skin inspection to matters scientific. I was working on high-frequency gravitational waves (HFGWs) again that week and ask Larry what effect they might have on human skin. He said that the effect would probably be negligible; but “... since electrical fields affected muscles (like in Shelly's frog legs ...) the extensions and contractions of material, such as muscles, as a gravitational wave (GW) passes through them, might be similar to an electrical field's effect.” (GWs twist, squeeze and stretch space, but the effect is incredibly small except for HFGWs.) In fact, Larry said, there had been many such devices marketed, such as “MicroBeauty” with glove electrodes using this electrical-field effect to strengthen muscles as the result of waves of an alternating electrical field relaxing and contracting muscles just below the skin's surface as shown in [Slide #4](#).

Muscle Relaxations and Contractions

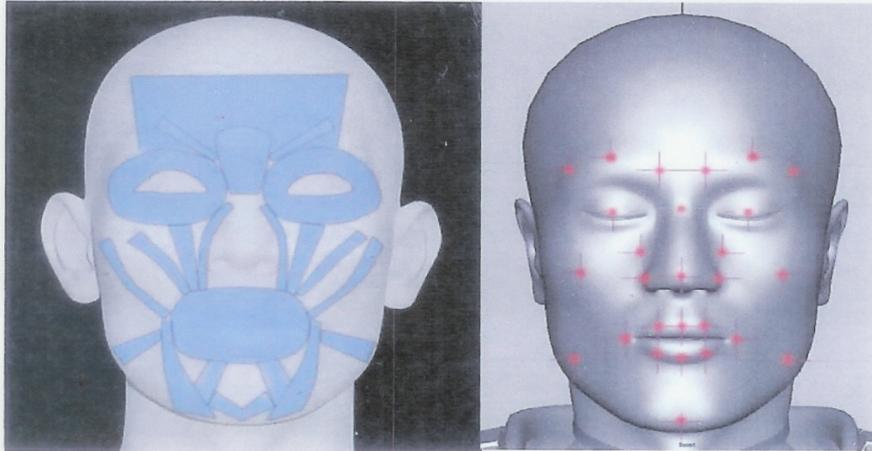


The effect amounted to a non-invasive “facelift.” In the summer of 2006 we presented a paper entitled “Nano-mechanism HFGW delivery systems for dermatological applications” to the *International Congress of Nanobiotechnology & Nanomedicine (NanoBio2006)*, June 19th, in San Francisco concerning the possible effect.

It turns out that, from Dr. Moy’s observations, the natural frequency of the facial muscles is on the order of twenty cycles per second or 20 Hertz and far too low to qualify as “High Frequency.” Thus such high-frequency gravitational waves (very high frequency a prerequisite for their generation at a significant strength) would be of no practical value in face-muscle strengthening. Nevertheless, the Clinical Trials of these devices intrigued me. There were actual observational positive effects of electrical muscle stimulation on many of the subjects who had undergone electrical treatment – no question about it! I was led to inquire of Larry exactly what was the electrical-field requirements needed to properly stimulate the facial and neck muscles? He indicated that the muscles were at about 5 millimeters below the skin’s surface and an electric field there, alternating at about 20 Hz, would cause significant muscle strengthening dependent upon the strength of the electrical field measured in volts per meter. The length of the electrical application needed to be long enough to have significant effect, but not so long as to “tire” the muscles – about 20 minutes seemed appropriate. Thus was borne the concept for the Electrolift® face and neck lift!

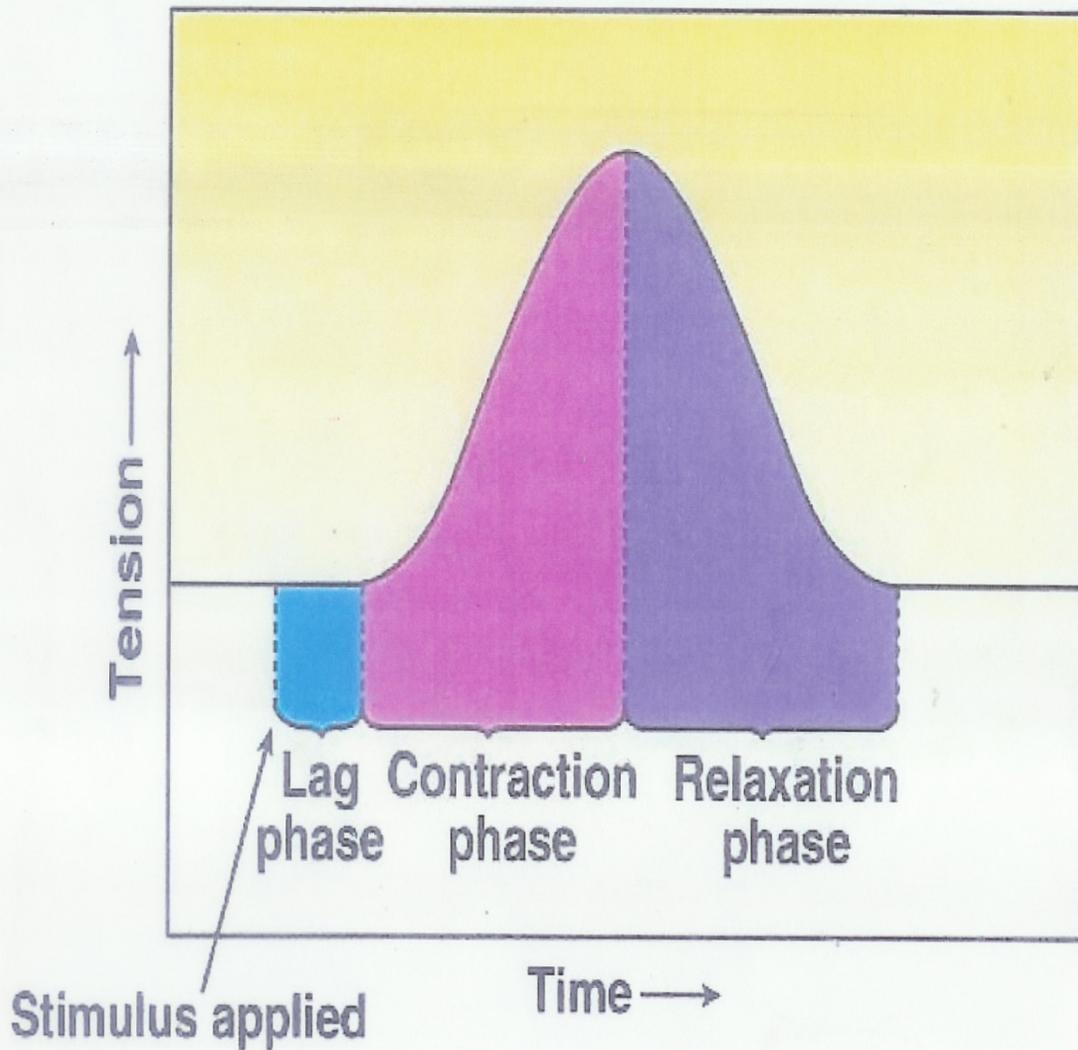
The following **Slide#5** exhibits the multidirectional aspects of facial muscles and aponeurotic layer and then a digital representation of the skin over muscles demonstrating smooth skin.

Multidirectional Aspects of Facial Muscles



Here's the concept in non-medical terms: The facial skin behaves something like a rubber band. As time goes by and after exposure to the elements and many extensions and relaxations, the rubber band loses some of its elasticity. If one now subjects **short sections** of the rubber band, sections that include small groups of rubber molecules and their bonds to each other (nanoclusters), to a sequence of relaxations and contractions, then the elasticity could improve. Unlike actual rubber bands, however, the facial skin actually rejuvenates and its elasticity **does** improve due to localized contraction and tightening. Also the facial skin (different from body skin) behaves like a rubber band in two rather than one dimension. The *Electrolift*® concept is to do this localized contraction and tightening of the facial skin artificially by low-voltage (about 4 to 8 volts) and low-frequency (about 20 Hz) electrical-field impulses causing a muscle twitch as indicated in [Slide#6](#)

Phases of a Muscle Twitch



6

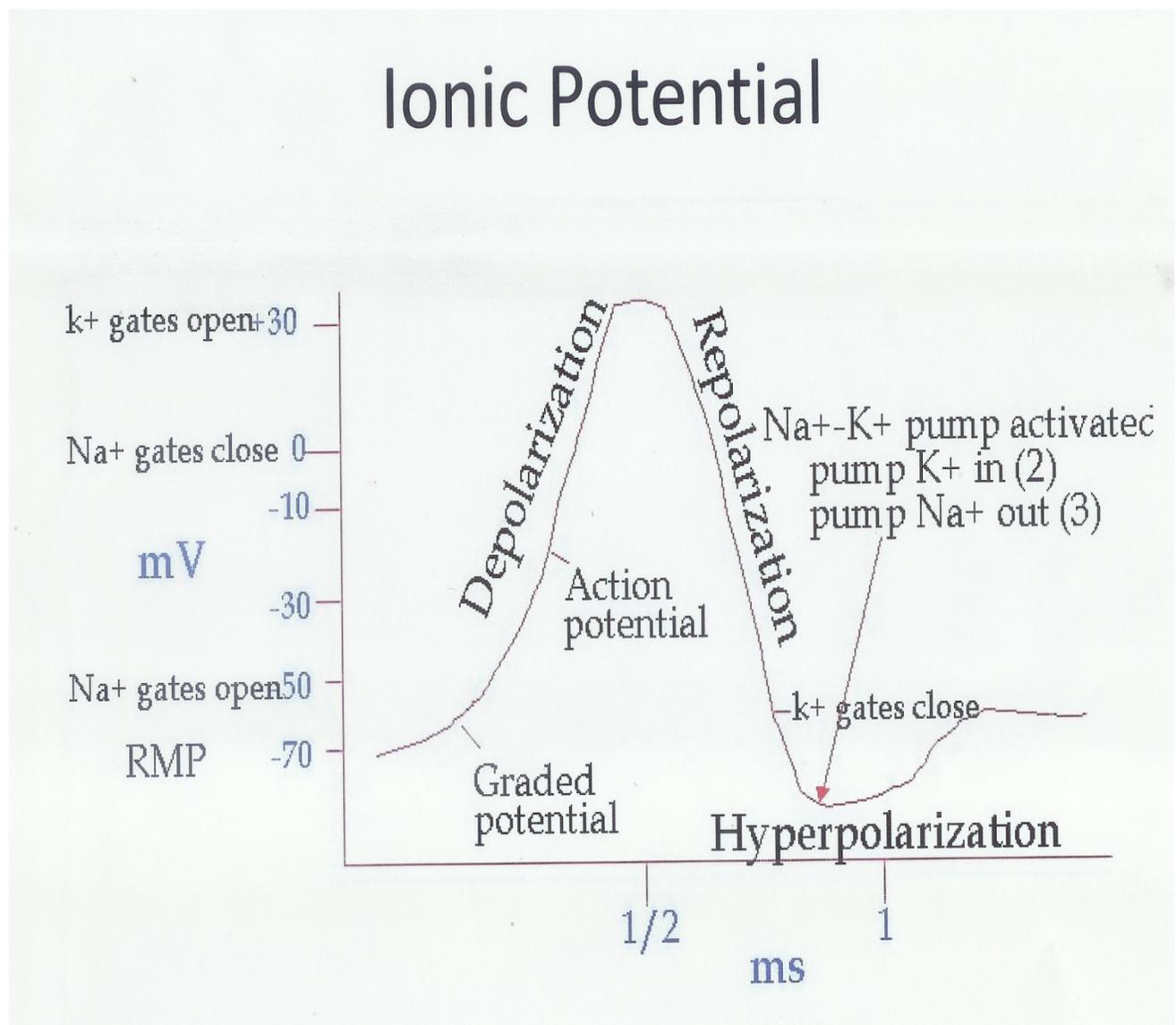
If there are constant ultra-pulsation stimulations to the muscle cells as shown in the slide, then there can be a minimization of the relaxation and lag phases, keeping the muscle at rest in a higher tension level. This can be a state called “isometric,” where the muscles do not actually change in length. As Dr. Moy, the Dermatologist continued, “Wrinkles and aging of the face may be due to changes

in the aponeurotic layer. One postulation is that the fast-twitch cycle of the muscles at a steady state resting phase is still at a low frequency (as he had said about 20 Hz). This resting frequency maintains a resting contractile tension. This mechanism may be a priority factor toward the skin maintenance and facial skin smoothness. With a degradation of uniform muscle frequency that occurs with age and sun damage, the muscle looseness subsequently causes skin laxity.”

Moy continued: “The fast-twitch cycle of the muscles results in an increase in elasticity beyond that of a “young” muscle. The passage of a low-voltage (on the order of two to ten volts) and low frequency (on the order of 20 Hz) through human body exhibits no deleterious effects and, in fact, is beneficial due to the rejuvenation of the protein-structured cells or myofibroblasts. Muscles, for example as part of the face, can age through years of use and sustained contractions. Much of the sagging or aging of the face, whereby the skin will loosen, leading to jowls or deeper wrinkles, is due to muscles losing their resting contractile state. There are studies demonstrating that the muscle cells during the aging process have decreased intracellular calcium. This leads to decreased stimulation for the muscle -- a decreased resting contractile strength of the muscle.”

Larry’s and my preliminary work was to deliver pulsed voltage of about 20 Hz to the skin. The voltage was only 4 or 8 volts, but because the electrodes are close together (about 5 mm apart), an approximately 800 to 1600 volts per meter strong alternating electrical field is produced near to the muscle filaments. As discussed by Larry Moy and shown in the following Ionic Potential [Side 7](#) (milli-volts versus milliseconds) he continued: “...the electrical potential of a cell is across its

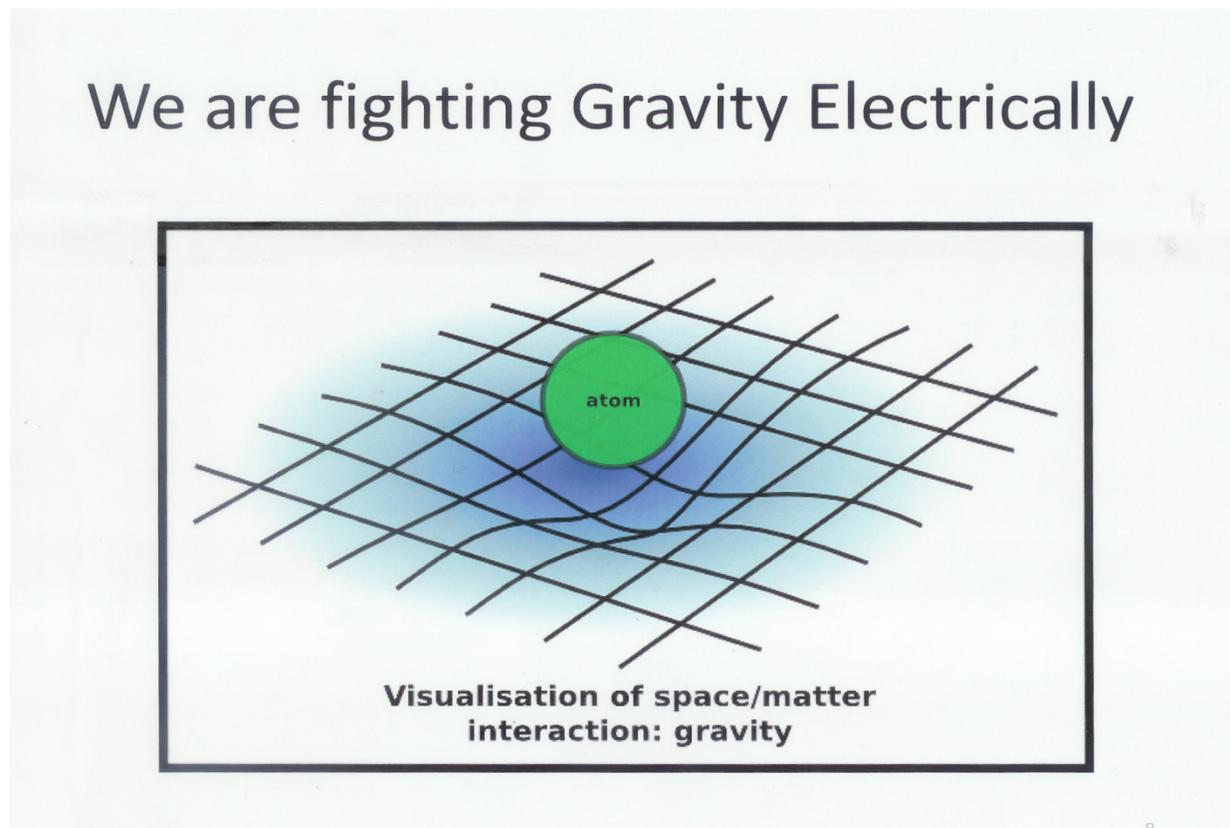
outer cell membrane and is stored from sodium inside the cell and chloride outside, creating a positive inner cell and negative outer cell – a dipole.



Such cells may exhibit an aspherical form, possibly representing a quadrupole mass distribution. The cytoplasmic energy (that is the stored energy of the cell, like a capacitor) and ionic potential can be measured at the points on the surface of the skin. By activating the Na-K pump (like a galvanic battery), the cytoplasmic electrical potential can be fluctuated and pulsed. This electrical potential will increase the calcium ion Ca^{++} to surrounding actin-myosin structures (that is the

protein structures that interact together), causing a contractile sequence as was exhibited in Slide 6.”

Well, this is a pretty complicated Dermatologist description by Larry that I understand about as much as he understands high-frequency gravitational waves. So here it is simply put as in Slide 8 : we are fighting the effects of gravity on our faces by “face lifting” electrically!



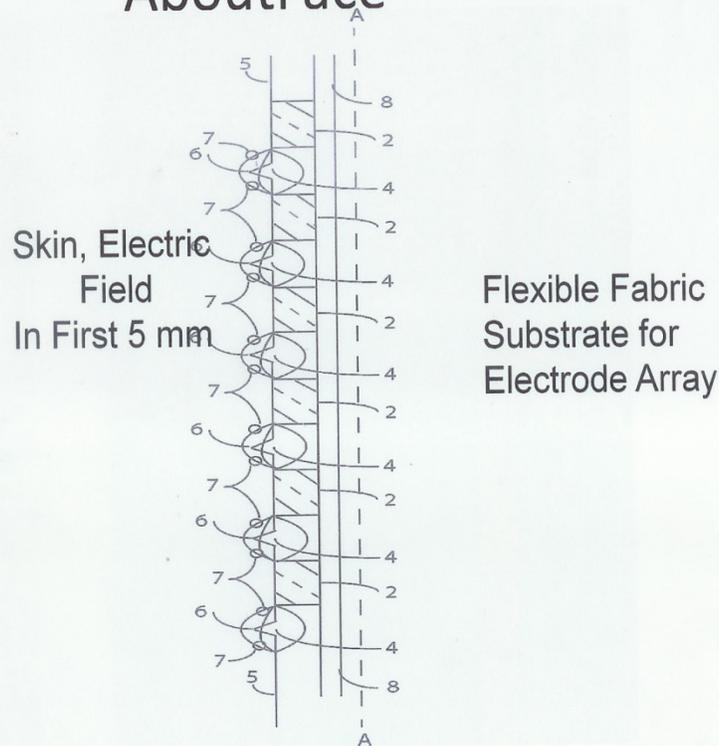
Our research as well as the research of others, has also shown that electrical fields and electrical potential also have had effects on skin cells themselves. Cell migration, especially in wound healing is very sensitive to nearby electrical fields. More recent studies show that inside the cell, there is an extremely high electrical potential that has not been previously measured. A sustained-frequency electrical potential that is applied to the cells appear to increase the cell electrical potential

by an electroporation effect. Electroporation is an increase in cell penetration and cell incorporation based on a local electrical field. This mechanism increases cell membrane activity and therefore helps decrease inflammatory cell reaction involved in the diseases of the skin. Specifically, recent indications in Moy's and my studies have demonstrated that an intense electric field of 800 volts per meter or above, having a frequency of about 20 Hz causes follicles to increase in the ionic potential and causes an increase in expelling of follicular debris. This produces an improvement of the skin by means of an improved follicular clearing and pore clearing in the skin and produces an anti-inflammatory effect. This finding has led to our clinical observations that rosacea (especially on Bonnie's face) and acne were remarkably improved! As Larry stated: "Included in the follicular effect is a stabilization of the pore wall, which is an inflammatory effect similar to the beneficial oral antibiotic effect on rosacea and acne."

There are numerous other muscle-treatment devices that involve electrically conducting gloves, inch-square pads, pairs of pencil-like or fork-like metal probes, etc. But no one had recognized the value of a strong electrical field, achieved by using narrow strips of closely spaced electrodes, that by their very geometry results in an intense field at the muscle filaments 2 to 5 mm below the skin's surface! The concept is exhibited in the next [Slide 9](#).

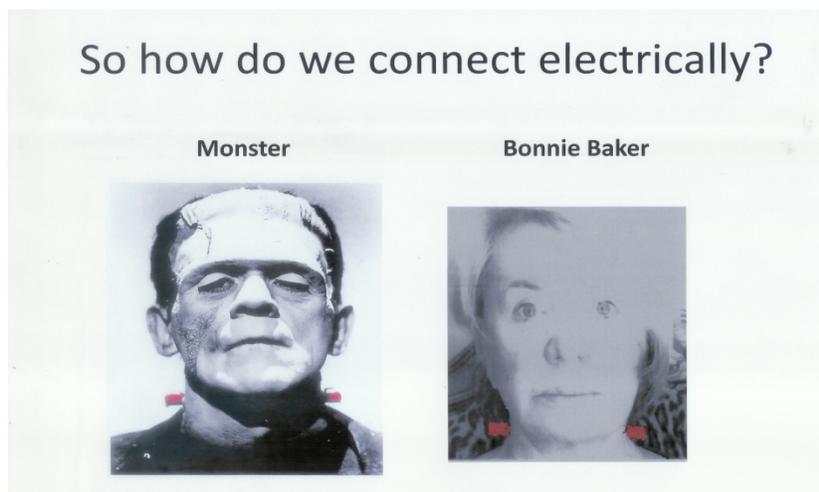
Intense Electrical Field to Top Skin Layer

Electrolift® Apparatus for AboutFace®



Here we see that the electric field near the skin's surface (2 to 5 mm from the surface) is intense because of the close distance between the electrodes. An electrical field is measured in volts per meter. In this case it is from 4 volts/ 0.05 m to 8 volts /0.05 m or 800 to 1,600 volts per meter. As a comparison other electrical-stimulation devices, such as *MicroBeauty* have about the same or lower voltage, but their electrodes (or gloves that they use for electrodes) are 10 to 20 cm apart. Thus the fields are 20 to 40 times weaker. To be sure the gloves can be placed closer together, but like the double-pronged, fork-like electrode devices,

they can only cover an extremely small skin area. Dr. Moy has told me that he has an entire collection of such electrical devices and has tested them all. The situation is that the physiology of electrical treatments has never been carefully studied before like Larry Moy has done. But an internationally well-known and knowledgeable trauma surgeon, Dr. Tom Brophy wrote concerning Moy's theory: "You really did your research well from an anatomical / physiological standpoint, referring both to the layout of the facial musculature, all the way down to the actin and myosin muscle fiber interaction and the Na⁺/K⁺ channels that regulate the action potentials which allow for muscle contraction." Here's the point: Dr. Moy, believes that an MD and an Engineer (with training in Electrical Engineering) had never gotten together before on this approach to noninvasive, electrical "facelifts." Dr. Moy laid out the problem to me: "What is required is a strong oscillating electrical field about 3 to 5 mm below skin's surface covering a significant area of the face or neck." Well, I figured out a way to do just that and, as I will discuss, I have checked over 200 Patents, Patent Applications and marketed devices and no one to date has developed a device that produces a sub-skin-surface effect that satisfies Larry's requirement – **until now!** OK in theory and in preliminary experiments we found that our noninvasive electrical facelift should work, but how do we connect up to electricity? **[Slide 10](#)**



The idea is not to stick electrodes into the neck, as Shelley hypothesized for her Monster, but lay an array of closely spaced electrical conductor strips or “traces” right next to the skin on a flexible substrate.

There are several conducting materials that one can use for electrodes including the copper traces of the following [Slide 11](#), aluminum strips, printing them on flexible fabric, etc.



[Slide 12](#) exhibits a couple of experimental arrays that I tested almost two years ago early in the experimental program

Arrangement and Test of Several different Prototype Arrays

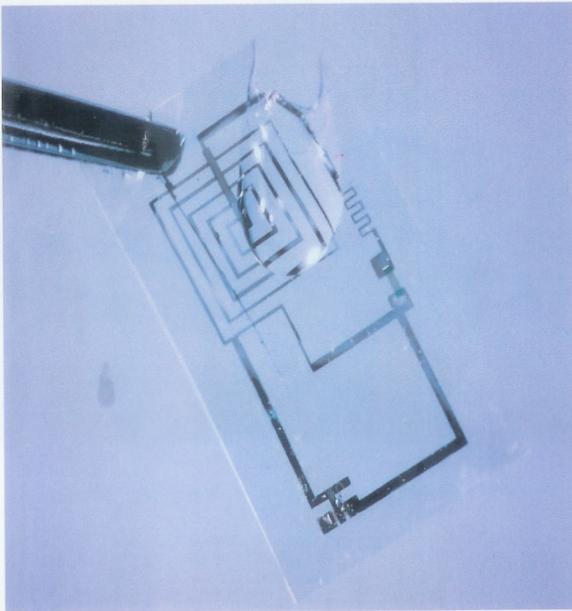


12

The array that fitted closest to the skin and was the most comfortable to wear was either silk (left side) or vinyl (right side) using silver epoxy conductive ink as shown in [Slide 13](#) .

Or can be printed using silver-epoxy ink

Silver epoxy ink circuit printed
on silk substrate



Silver epoxy ink circuit printed
on vinyl substrate



5 MIL SAMPLE LAMINATE on 0.035"
vanilla vinyl fabric material

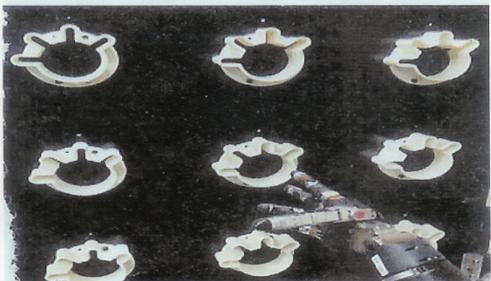
13

Utilizing silver-epoxy ink printed circuits on fabric is especially desirable since they conform more closely to the skin surfaces and are far more comfortable to the user than, for example, a stiff Mylar substrate that was shown on [Slide 11](#). Such fabric substrates for electronics may afford some amazing technological breakthroughs. Allow me to digress briefly on the potential scientific advances afforded by flexible fabric circuits: You sit down at a table and pull a handkerchief out of your pocket. You carefully spread it out on the table. Suddenly a computer screen

appears above your handkerchief, essentially a holographic projection (please see <http://www.dailytech.com/NextGeneration+MidAir+Display+Technology+Debuts/article6287.htm>). And on the table just in front of you appears a keyboard. You start to work on the computer or call a friend on your i999pad and talk to him face to face. Currently available flexible batteries and solar cell power your hanky. Tired – you fold up your handkerchief wipe the sweat off your forehead with it and set off to a party.

A major advanced medical-technology frontier is implanting permanent microcircuits in man. A primary application is planting them in the human brain and “connecting” them to neural networks there. For example one could “replace” lost memory neurons caused by Alzheimer’s disease by electronic memory circuits. Already scientists are able to implant microcircuits in human brains that are connected to and animate robotic arms **Slide 14**. This advance was **runner up for the most important scientific achievements of 2012!**

Brain Implants Using Fabric Flexible Circuits



Runner up for the most important scientific achievements of 2012!

14

The reason for flexible fabric substrates for implantable microcircuits is that they fit easily into human tissue. Here we find a profound evolutionary advancement for man. Such “applications” to the brain, ocular ear implants, artificial hips, knees, hearts, pancreas, etc. not only seem to lead to a modern “Six Million Dollar Man” but more profoundly to an improved brain and “mind.” This appears to be the dawn of an evolutionary step of human kind towards the Cyborgs – those nearly human part-man-part-electronic beings who have almost infinite longevity -- that I discussed in my last talk. We are clearly on the verge of something very, very BIG! There is nothing faster than the speed of technology and these flexible fabric microcircuits help empower that speed.

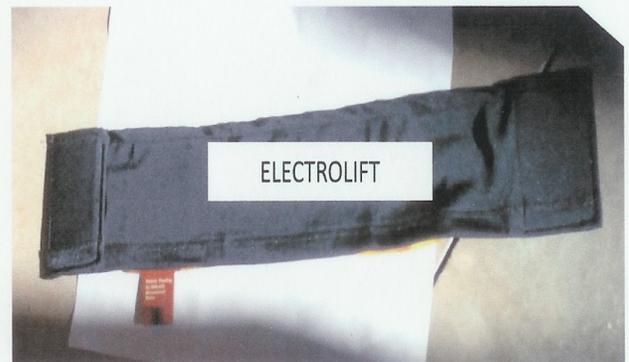
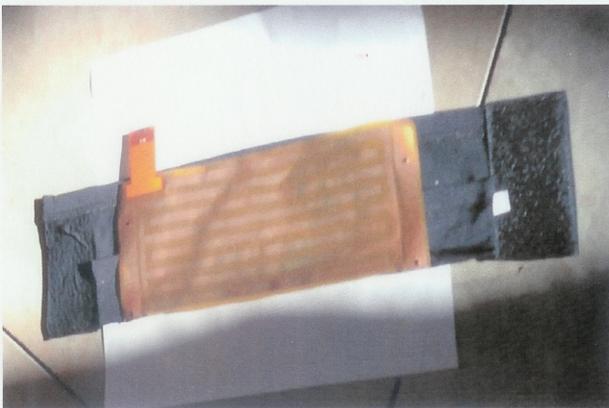
But now let us return to our subject of *AboutFace*®: Next in our quest for an improved face one simply connects the *Electrolift*® array to a 20 Hz oscillator shown in [Slide 15](#) (I am with our primary manufacturer: Bobby Chian -- however I should note that concerns in Taiwan and on the mainland in China seem to have the least expensive manufacturing).

A 20 Hz Oscillator Attaches to It



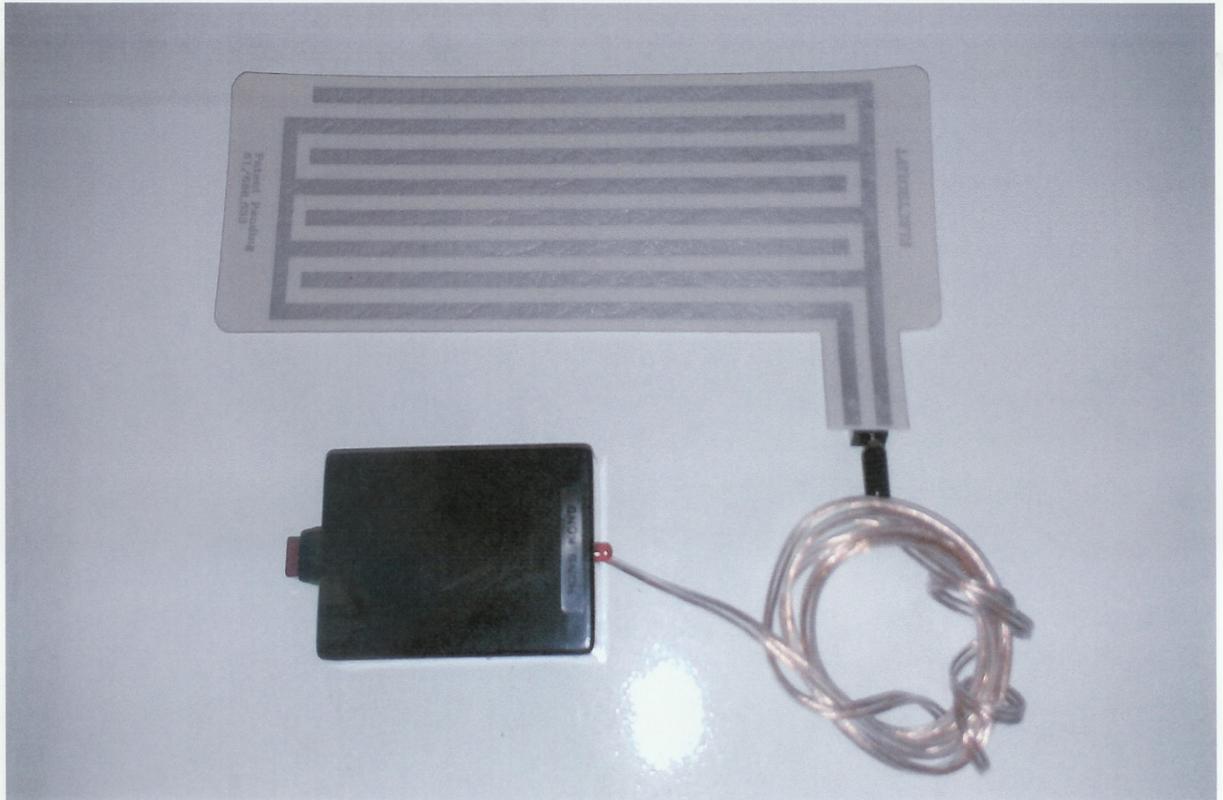
The flexible array can then be held in place by a face mask or a scarf or neck wrap as shown in [Slide 16](#). The advantage being that the subject wearing the apparatus, with oscillator component in a pocket, can move effortlessly around and accomplish tasks without encumbrance.

In One Embodiment the Flex Array Fits on the Inside of a Wrap that Fits Around a Subject's Neck



The latest working prototype is shown in [Slide 17](#). The flexible array above attached to an Oscillator and Controller module below that can be tucked in a pocket.

Latest Working Prototype



This is an especially important feature for a housewife who doesn't want to interrupt her chores for a treatment. Our approach might be to License Sites or set up Kiosks in, for example, Malls at "hot" areas e.g., Beverly Hills, Chicago, New York, Atlanta, Miami, etc. and overseas in Hong Kong, Beijing, Shanghai, Seoul, Bangkok, Rio de Janeiro, San Jose Costa Rica, Mumbai, Singapore, et al. Marketing will no doubt also very significantly involve Internet and Social Media. In any event, we will utilize the production, marketing and distribution expertise as well as the over-two-decades of experience of my partner, Dr. Moy **Slide 18.**

Lawrence S. Moy, MD

Curriculum Vita

After graduating from the University of California, Los Angeles' (UCLA) School of Medicine, he worked with some of the biggest names in the cosmetics industry, including Neutrogena, Almay, MD Formulations and *Regenetrol* Labs, conducting extensive research and laboratory studies. He is the former *Chief of Dermatology* at UCLA's Harbor Medical Center, and is the *Medical Director for Regenetrol* Labs.



President of *Moy Skin-Care Products* and *LawrenceMOYMD*, Expert in Social-Media Marketing

18

Our competitors range from “Lifestyle Lift,” a multi-thousand dollar surgical procedure that implants strings into a persons’ neck, to beauty parlor devices, various laser wands, and, of course, lotions and creams often bothersome or messy treatments and not “reusable” like *Electolift*®. Other *AboutFace*® embodiments would involve the array and its substrate to be in the form of a pillowcase or bed sheet for convenient treatment even during a subject’s sleep.

All this electrical impulse stuff sounds fine; however will it harm the subject? The following answer to that question involves a few somewhat complicated matters that may be difficult for us to understand so I will go through it rather slowly – hopefully I will not bore anyone. Let's take as an example the resistance R of the array that was shown in [Slide 11](#) composed of nine nineteen-cm long, five-mm wide copper traces or strip electrodes or epoxy-silver conductive ink strips (ten electrodes in total, but only nine gaps or channels between the electrodes or 171 cm of channels in total) in contact with face or neck skin. In [Slide 19](#) is shown an experiment to measure the cheek and neck skin resistance, R , using 10-cm long strips, 5mm apart just as in our array.

Measurement of Skin Resistance August 7, 2012

**Forehead & Face
Resistance**



Neck Skin Resistance



2 to 5 Mega ohms per cm between
electrode traces

19

Admittedly this analysis will be a little complicated, but not “Rocket Science.” On the other hand, I will present it in excruciating detail since we scientists are a merciless bunch and want everyone to be aware of our analyses whether they like it or not! So **here goes**: Since the properties of the skin vary tremendously all over our bodies and we are interested, at least for the time being, in neck and face skin, we could cut pieces of that skin out, put them between the probes of an Ohm-meter and take a reading. Not only would this hurt but it is not the resistance we want to measure! We actually want to measure the resistance between any two of our conducting electrodes or traces on the face and neck. As we saw on the last slide we placed two 10-cm long electrodes on the skin areas of interest and then placed the Ohm-meter probes on each of the adjacent strips and took a reading. We then divided that reading by 10 in order to obtain the ohms per centimeter and that turned out to be about 5 Mega-ohms per cm. See the following [Slide 20](#).

Any Possible Harm to the Subject?

At $V = 4$ volts the current through the $29\text{k}\Omega$ skin (for 171cm of skin between traces: $5\text{M}\Omega/171\text{cm}$) is $V/R = 4/12 \times 1000 = 333$ micro-amps to $4/29 \times 1000 = 138$ micro-amps or, on average, about 230 micro-amps. Therefore the Maximum Current Density, (mA/cm^2) in the skin is roughly 230 micro amps per $5\text{ mm} \times 171\text{ cm} = 86\text{ cm}^2$ area of tissue or $230 \times 10^{-6}/86 = 2.7 \times \text{micro A}/\text{cm}^2$. The **power** across the 86 cm^2 area of skin under all the electrode pairs is $I^2 R = (230 \times 10^{-6})^2 (26 \times 10^3)/86 = \mathbf{0.016\text{ milliwatts}}$ per square centimeter Maximum Power Density, (W/cm^2). It is a bit complicated, but the bottom line is that according to FDA the maximum power density should be less than $0.25\text{ Watts}/\text{cm}^2$ or $\mathbf{250\text{ milliwatts}}$ per square centimeter to reduce the risk of thermal burns; **so that the apparatus will not be injurious to the subject. Our Electrolift[®] apparatus meets the FDA standards of Level ii approvals for appliances.**

In order to estimate the current flow through **the entire array of traces or electrodes** we need to **divide** the ohms per cm by the length of **all** the traces, which turns out to be 171 cm (division is because the more resistors in parallel [every centimeter between the electrodes is effectively another resistor] the **less** is the overall resistance). Thus the resistance of all the skin between and under the entire array is 5 Mega-ohms per cm divided by 171 cm equals about 29,000 ohms. Now you may not remember decades after you studied High-School Physics, but the current through a resistor is the voltage applied to the resistor divided by the resistance. This makes sense because the higher the voltage the more current and the higher the resistance the less current. Therefore at an applied voltage, $V = 4$ volts the current through the **entire** array is about $4/29 \times 10^3 = 138$ micro-amps or, on average, or to be on the safe side (safety factor) about **230 micro-amps for the entire array** or in Engineering notation 230×10^{-6} Amps. Now we are also interested in current density, which is the current through every square centimeter of skin under the electrodes or traces. The electrodes are about 5mm or 0.5cm or 0.05 meters apart in order to have a strong electrical field at the 2mm-to-5mm deep skin muscles. Thus the area of the skin between the electrodes is 0.5 cm multiplied their length or $0.5 \text{ cm} \times 171 \text{ cm} = 86 \text{ cm}^2$. Therefore the Maximum Current Density, (mA/cm²) in the skin between the electrode pairs is roughly 230 micro amps per 86 cm² area of tissue or $230 \times 10^{-6} / 86 = 2.7$ micro A/cm². On the other hand the most **crucial factor is the heat developed** in the skin caused by the aforementioned current as that indicates whether or not the apparatus is safe. We might remember the scene in the movie *The Green Mile* when Percy deliberately sabotages the execution of Jeter: Instead of wetting the sponge used to conduct electricity and make executions quick and effective, he leaves it dry, causing the execution to malfunction dramatically -- too much electrical heat! Also from High-school Physics one might remember that power or heat is equal to current squared

multiplied by resistance for example the heat from an electric stove in watts goes up as the square of the current through it – well anyway it does. The heat across the 86 cm² area of skin under the electrode pairs is $I^2 R = (230 \times 10^{-6})^2 (26 \times 10^3) = 1.4$ milliwatts and divided by the array area of 86 square centimeters is **0.016 milliwatts per square centimeter** Maximum Power Density. It is a bit complicated, but the bottom line is that according to FDA the maximum power density should be less than 0.25 Watts/cm² or **250 milliwatts per square centimeter** to reduce the risk of thermal burns (burns like Jeter received); so that the apparatus will not be injurious to the subject and *Electrolift*® would never be satisfactory for an electric chair! As far as FDA approval goes our apparatus meets the FDA standards of Level ii approvals for appliances.

Another concern we had was whether or not our apparatus was new and unique. As already mentioned there are many electrical muscle stimulators and skin treatment apparatuses on the market. All had been found not competitive with ours. On the other hand what really matters are patents. We recognized that many patents are granted that protect the inventor's concept but never are brought to market. So we must search all relevant patents and patent applications. This turns out to be a huge task. We could hire a firm to accomplish the search; we know our idea better than anyone so this was a task that we simply could not delegate!

It really boggles the mind to realize how many millions of patents there are out there! The first thing to do in a search is to find the Classification Number of your invention as shown in **Slide 21**.

U. S. Patent Office Search Classification Numbers

002	004	005	007	008	012	014	015	016	019	023	024	026	027
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049	051	052	053	054	055	056	057	059	060	062	063	065	066
068	069	070	071	072	073	074	075	076	079	081	082	083	084
086	087	089	091	092	095	096	099	100	101	102	104	105	106
108	109	110	111	112	114	116	117	118	119	122	123	124	125
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716	717	718	719	720	725	726	800	850	901	902	903	930	968
976	977	984	987	D01	D02	D03	D04	D05	D06	D07	D08	D09	
D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	
D23	D24	D25	D26	D27	D28	D29	D30	D32	D34	D99	G9B	PLT	

607 Applies to Electrical Muscle and Skin Treatment Apparatus (601 has some relevance also)

21

You start out with some key-word identifiers, and then once you have found a few relevant patents you use their classification codes as well. In our case Classification Number 607 Applies to Electrical Muscle and Skin Treatment

Apparatus (601 has some relevance also) and our search begins with those Classification Numbers. From some of the other patents (and also Patent Applications) we found some sub-classification numbers to extend and pinpoint our search as exhibited in. [Slide 22](#).

76 Oscillating Signal is Subclass

These are the Patents in the Subclass

Results of Search in US Patent Collection db for:

CCL/607/76: 157 patents.

Hits 1 through 50 out of 157

These are the Patent Applications in the Subclass

Results of Search in PGPUB Full-Text Database for:

CCL/"607"/76: 21 applications.

Hits 1 through 21 out of 21

Oscillating signals (subclass 76) was one of our subclasses -- the main one in fact. We located more than 200 Patents and Patent Applications that had some relevance to our invention. An example of one of the most closely related ones (“*MicroBeauty*”) is shown in [Slide 23](#).

A comprehensive search of over 200 relevant Patents and Patent Applications was accomplished and a Provisional Patent Granted

United States Patent: 7110826 ! Micro Beauty!

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(19 of 157)

United States Patent 7,110,826
Motoi September 19, 2006

Cosmetic use alternating current wave forms and cosmetic device

Abstract

A beauty device is provided that offers conditions that are appropriate for electrical stimulation that is designed to resolve wrinkling, sagging and such of skin conditions. A pair of electrically conductive gloves and that include silver conductive material is worn on both hands that have been clad in insulated gloves. A combination of ultra-weak electrical currents that are comprised of a combination of multiple types of current wave forms made up of alternating current square-waves of differing patterns are provided from the electrical current control device and applied to the surface of the skin in areas such as the face through the electrically conductive gloves by having the gloves come into contact with the skin, thereby reducing the wrinkles, sagging and such of the skin.

Inventors: Motoi; Shingo (Tokyo, 160-0022, JP)
Appl. No.: 10/410,639
Filed: April 9, 2003

Related U.S. Patent Documents

Application Number	Filing Date	Patent Number	Issue Date
09515444	Feb., 2000	6584359	

Foreign Application Priority Data

Jan 18, 2000 [JP]	2000-8971
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Current U.S. Class: 607/76 ; 607/115; 607/48; 607/50
Current International Class: A61N 1/32 (20060101)

Here is an example, but all searched patents and applications are silent on a closely spaced array of electrodes and of the efficacy of an intense electric field on the skin and muscle filaments and a specific 20Hz frequency. **Moy's skin and muscle research is ground breaking and unique.**

Now that we felt confident that our invention was new (and not obvious) we recently filed for a Provisional Patent. It covers you for about a year and is not passed by patent examiners; but must be replaced by a standard Utility Patent within that year. Now we renewed our search. But all searched patents and applications are silent on a closely spaced array of electrodes and of the efficacy of

an intense electric field on the skin and muscle filaments and a specific 20Hz frequency. We concluded that **Moy's skin and muscle research is ground breaking and unique and so was our Invention!**

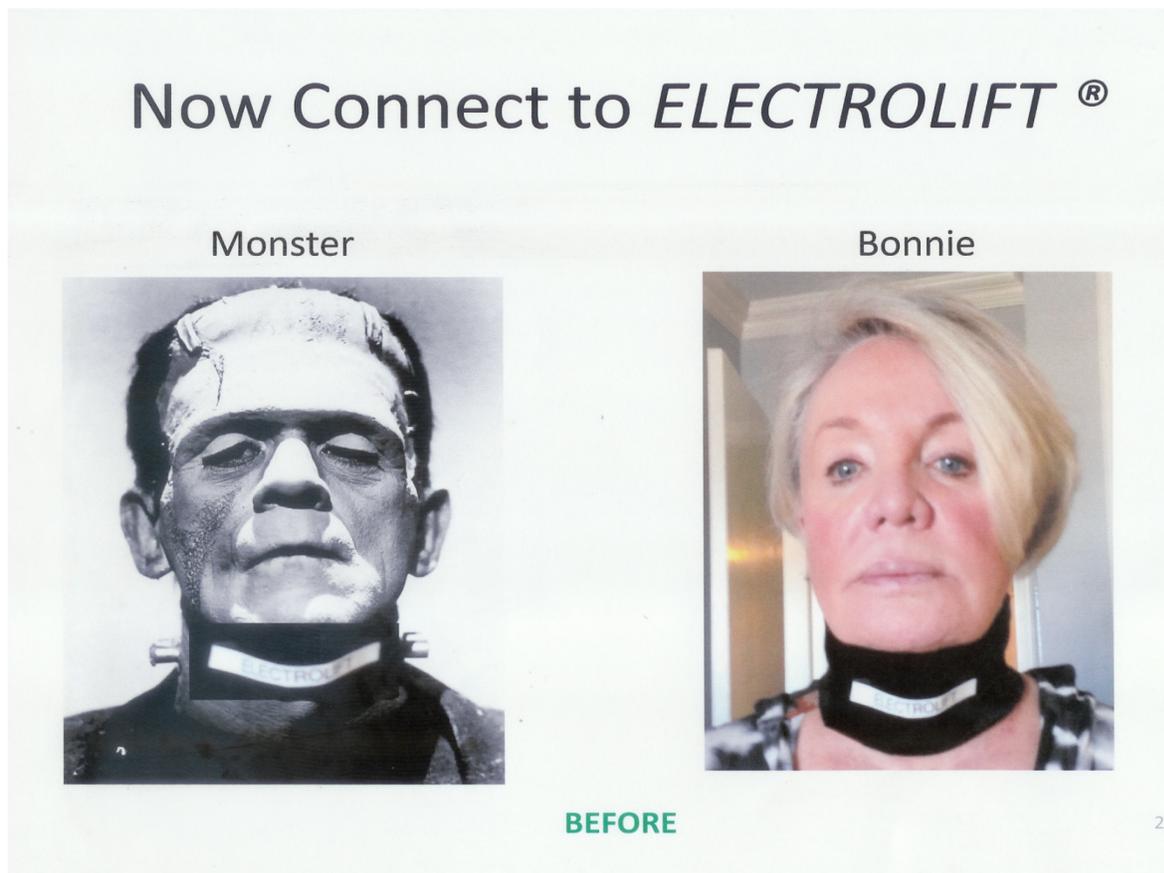
We now turn to the Clinical Trials. [Slide 24](#).

Clinical Trials

- All the patients tested, 20 out of 20, got positive results.
- The skin was carefully logged and tracked for improvement in wrinkle depth, wrinkle width, wrinkle length, tightness in the skin, texture, sagging and overall improvement of the skin by a Dermatologist.
- They were double blind trials in the sense that we enlisted others to view the photographs without telling them which were before and which were after. Selection the same.
- Patients got sustained benefits for well over 2 weeks after the Electrolift®. There would be a regimen of systematic bi-weekly treatments for all users.
- Results occurred after 15 to 20 minutes of treatment.
- Results exactly matched the physics that predicted the muscle frequency and electrical response.
- Actual Photographic evidence follows after connection to Electrolift®.

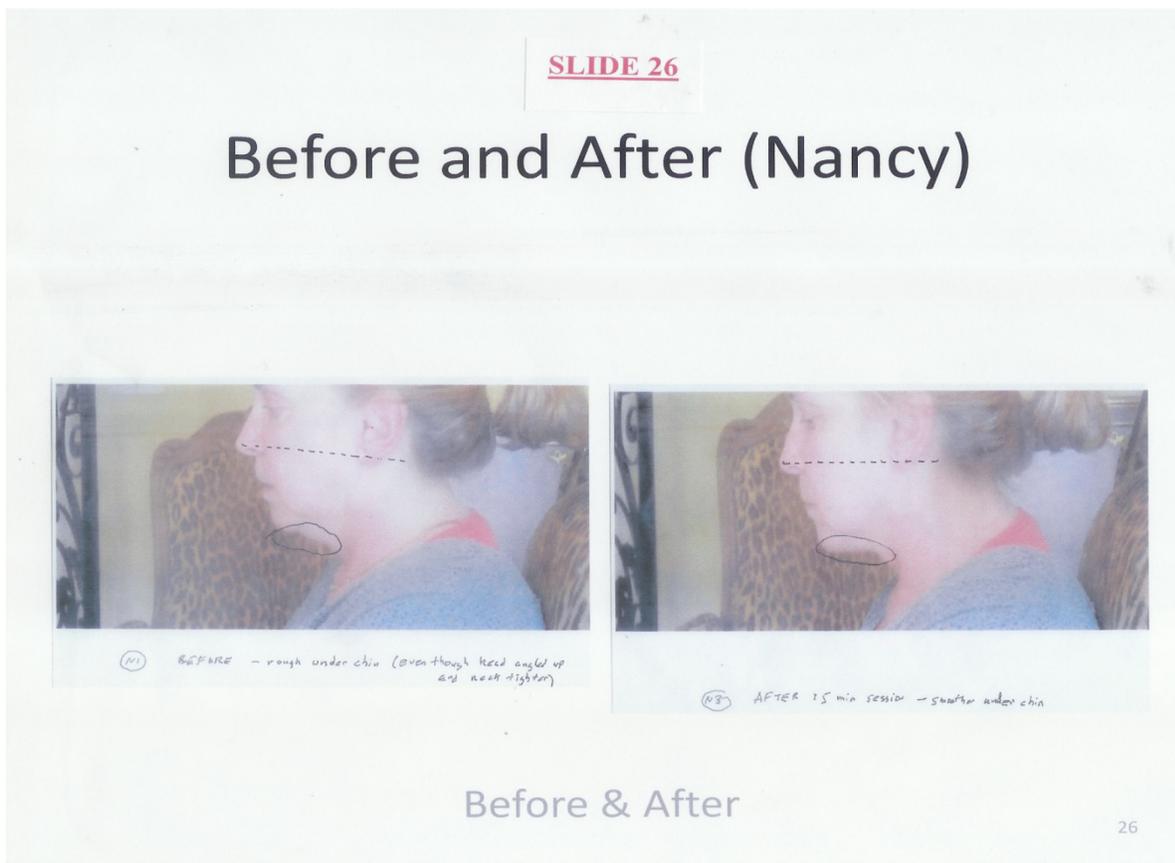
Here we selected Patient volunteers who were chosen based on their desire to improve the facial lifting or tightening of the skin. No patients or test subjects were chosen with recent treatments of face or neck lifts, facial injections, lasers or peels. Several ethnicities were selected, but only women between the ages of about 30 to 60 +. There is no reason not to believe that the effect should be achievable in men as well and that might be an important market; but we only tested female subjects. The trials were double blind in the sense that we sometimes enlisted others to view the photographs without telling them which were before and which were after – but the selections were always the same (correct) ones and were such that double-blind protocol was not really necessary.

In most of the Clinical Trials we utilized the face mask or the neck wrap connected to *Electrolift*® as shown in [Slide 25](#)



- We utilized 20 subjects and all 20 showed improvement.
- The skin was carefully logged and tracked for improvement in wrinkle depth, wrinkle width, wrinkle length, tightness in the skin, texture, sagging and overall improvement of the skin by a Dermatologist.
- Patients got sustained benefits for well over 2 weeks after the *Electrolift*®. There would need to be a regimen of systematic bi-weekly treatments for all users.
- Results occurred after 15 to 20 minutes of treatment.
- Results exactly matched the physics that predicted the muscle frequency and electrical response.

The first subject is Nancy Gossett a good friend and a willing, although somewhat nervous, participant [Slide 26](#). (She calmed down when I showed her the power supply was only a tinny nine-volt battery.)



A lot of treatment interpretation depends upon the angle of a subject's chin. If you elevate your chin your neck will, of course, be stretched and some wrinkles will disappear naturally. Conversely, if you lower your chin wrinkles will appear. In this case Nancy had a good result after only a 15 minute treatment, but I had her drop her chin a little to make sure that her improvement was not due to chin position. It was important in all of our Clinical Trials to have the subjects assume exactly the same position after a treatment for the photograph as they had done before. I would use a bubble level, [Slide 27](#), to insure this. But maybe some kind of head rest to constrain the subject's position would be better.

SLIDE 27

Bubble-level to Keep same Head Angle for Before and After Photos



Remember, however, it is the results that a person sees in the mirror that only really counts. And these days social media broadcasts such results faster and better than any paid before-and-after picture advertising!

In the next slide, [Slide 28](#), we see an improvement in the jaw line and also in the skin texture. Again we had to be sure the neck tilt was comparable in the before and after pictures. The chin and neck angles were the same before and after to a couple of degree as judged by bubble level for the picture sets.



In [Slides 29 , 30](#) and [31](#) we view the improvement in the neck.

SLIDE 29



Horizontal
Neck
Lines

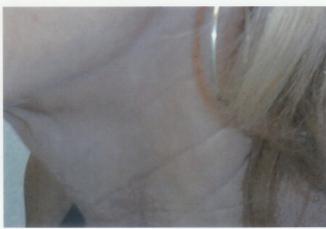
Before



After

SLIDE 30

Christy



Before & After

30

SLIDE 31



Before



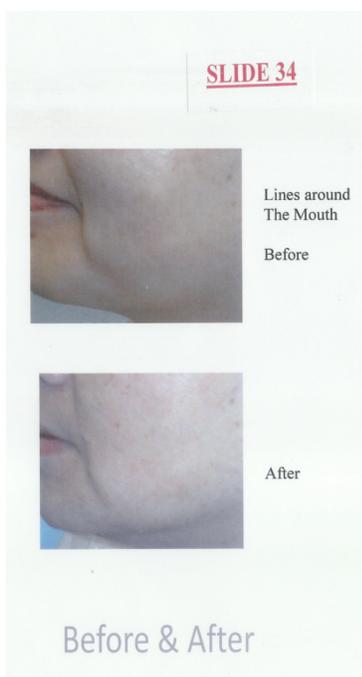
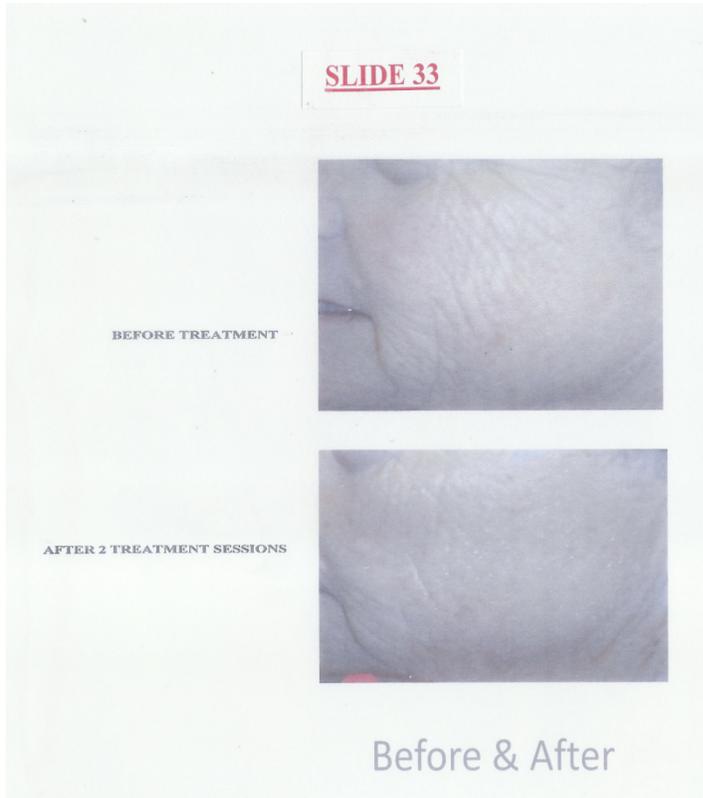
After

Before & After

The improvement is certainly shown, but in the first case, [Slide 29](#), the lighting and camera distance played an important role. In the second and third, [Slides 30](#) and [31](#), there was no question about the marked improvement of the neck tissue. Remember also that the before and after improvements were also carefully judged by a Dermatologist. As an aside, in those weight-loss advertisements it all depends upon how you hold your stomach in. Bonnie showed me how she can lose 15 pounds in 1 minute by a change in posture – simply amazing! Years ago we were in Las Vegas and there was Mamie Van Doren sitting on a diving board. We asked if we could take her picture and she replied “Sure but just give me a second to get ready.” In a second she had sucked her stomach in the pushed her Boobs out and became a totally different (and much better looking) woman! Posture counts! In [Slide 32](#) we looked for an improvement in Lines around the Lip and Nose.



The improvements were there, but her head was tilted side-to-side differently and it is difficult to objectively judge the degree of improvement. The mouth and cheeks were given our *Electrolift*® treatment in, [Slides 33](#) and [34](#).

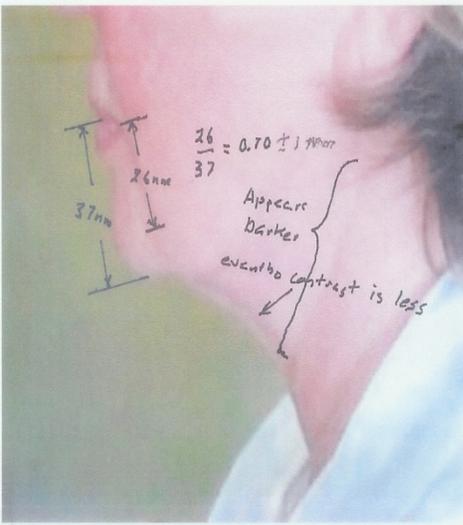


In Slide 35 we have a quantitative measurement of the change a wrinkle's length occasioned by one 15-minute treatment.

SLIDE 35

Quantitative Wrinkle Measurements

One 15 Minute Session and two weeks after,
9 ± 2% reduction in wrinkle length

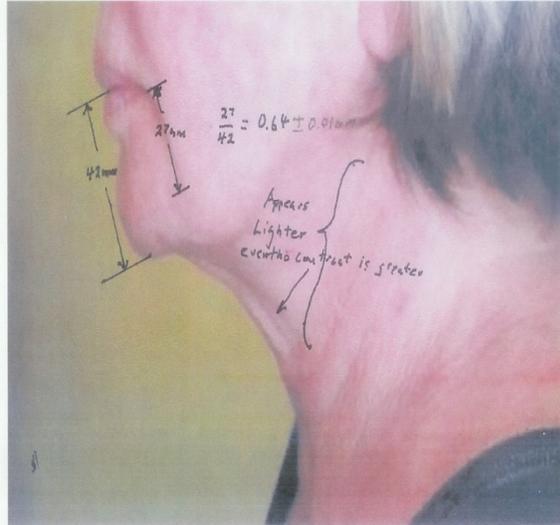


$\frac{26}{37} = 0.70 \pm 0.01 \text{mm}$

Appears Darker
cutaneous contrast is less

(B1)

$$\frac{0.70 \pm 0.01}{0.64 \pm 0.01} = 9 \pm 2 \%$$



$\frac{27}{42} = 0.64 \pm 0.01 \text{mm}$

Appears Lighter
cutaneous contrast is greater

AFTER (B2)

$$\frac{0.70 - 0.64}{0.64} = 9 \%$$
 length reduction in 15 minutes
± 2%

Wrinkle ends marked and measured

35

In this case there are no subjective observations and camera angle, head angle, camera settings and lightening had no effect. The length of the wrinkle was

reduced $9 \pm 2\%$. Before and after the treatment the ends of the wrinkle were well defined. It is hypothesized that the reduction in wrinkle length will last longer than two weeks and may even improve after month. There was also significant improvement around the eyes as shown in [Slides 36](#) and [37](#).



In this case we used two treatments and the photographic evidence as well as a Dermatologist's inspection showed definite improvement. In general – after many trials we found that two 15 or 20 minute sessions yielded the best results. Longer treatments or more than two or three treatments did not seem to be significantly more beneficial. The positive effects lasted at least more than two weeks – we were not able to follow the subjects longer than that, but theoretically one would expect to repeat the treatments every two weeks or so for semi-continuous improvement. On the other hand, with regard to rosacea the effects, it appears to be long lasting. Bonnie had breakouts of rosacea about every two months for almost ten years now. After her Electrolift® (or “About Face®”) treatment she has not had a rosacea breakout for over a year!

But Now, Finally, the Results of the Premier Clinical Trial. 38

You have seen them BEFORE

But Now AFTER

BEHOLD!

Voila!
quod erat demonstrandum
mirabile dictu!!

Monster



Bonnie

