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IN THE UNITED STATES DISTRICT COURT

EASTERN DISTRICT OF CALIFORNIA

IVAN PEÑA, ROY VARGAS, DOÑA CROSTON, BRETT THOMAS, SECOND AMENDMENT FOUNDATION, INC. and THE CALGUNS FOUNDATION, INC.,

Plaintiffs,

v.

STEPHEN LINDLEY,

Defendant.

Case No. 2:09-CV-01185-KJM-CKD

DECLARATION OF TODD LIZOTTE IN SUPPORT OF DEFENDANT'S SUPPLEMENTAL BRIEF

Dept.: Courtroom 3, 15th floor
Judge: The Honorable Kimberly J. Mueller
Trial Date: None at this time
Action Filed: May 1, 2009

DECLARATION OF TODD LIZOTTE

I, Todd Lizotte, declare as follows:

1. I have personal knowledge of the facts stated herein and would and could testify competently thereto if called as a witness in this matter. I am the inventor of microstamping, which I created in 1994. My engineering career within the laser micromachining industry has spanned over 25 years in the roles of development engineer, senior laser systems engineer and to my current executive position, which I have held for the last ten years serving as the US Director of Emerging Technology, for a division of Hitachi Ltd. I have published over 60 articles, peer reviewed technical papers and presentations at domestic and international conferences on the application of lasers in material processing for laser initiated explosives, high volume automotive, microelectronics, medical, and commercial and consumer industries. I hold over 25 patents and have other patents pending in the field of laser micromachining, laser based high volume manufacturing systems, microscopy, machine vision inspection, laser material interaction and lasers.

2. As the inventor of microstamping, I have provided access to the technology and know how over the last 15 years, through articles in law enforcement journals, newspapers, testifying in front of state legislative committees as well as technical articles and through patenting the technology in 2000 to 2003. To provide further opportunities for the industry to have access to the technology, I purposefully allowed microstamping patents I hold to be placed into the public domain as an open source technology to apply to their products worldwide, free of royalty.

3. Furthermore, over the years I have publicly demonstrated microstamping technology seven times, using firearms outfitted with firing pin and/or breech face elements. The firearms at each test were handed over to local range officers to demonstrate microstamping technology and to show that cartridges could be collected and chosen randomly by the range officers, and placed under a stereo microscope for observation to extract the codes. Here is the list of places where this technology was publicly demonstrated, using firearms outfitted with generation 1.0 technology, which is capable of compliance with the California microstamping law: 1st Demonstration 5/22/06 CHP range in Sacramento, CA; 2nd Demonstration 7/27/06 Boston Police

Department in Boston, MA; 3rd Demonstration 6/18/07 Capital City Police Department, Washington DC; 4th Demonstration 8/14/07 Los Angeles Police Department, Los Angeles, CA; 5th Demonstration 3/3/08 Hartford Police Department, Hartford, CT; 6th Demonstration 5/19/08 New York State Police, Albany, NY; 7th Demonstration 11/18/08 Trumbull Police Department, Trumbull, CT.

4. Based on my experience, expertise, and my own testing results as the inventor of microstamping, compliance with microstamping requirements is technologically possible. Thus, manufacturers could meet the microstamping requirement on currently unrostered weapons, allowing such weapons to be rostered.

5. Firearm microstamping is a well understood technology and trace solution where intentional tooling marks are formed or micromachined onto firearms' interior surfaces that come into contact with or impact the surfaces of cartridge casings. The intentional marks can take the form of alphanumeric codes or encoded geometric codes, such as a barcode. These codes are linked to the serial number of a firearm by means of an "optimized laser micromachining" process. As the firearm is discharged, the marks transfer a code to the cartridge casing before it is ejected out of the firearm. When recovered at the scene of a crime, the microstamped cartridge can identify a specific firearm as the source of the cartridge, without the need to recover that firearm. The purpose is to provide an improved piece of trace evidence for forensic investigators, so that they can track a firearm without having to recover it. Microstamping therefore provides law enforcement with an important tool in solving crimes and thus deters unlawful gun violence by providing critical intelligence to allow law enforcement to apply resources efficiently and strategically.

6. The concept of microstamping is not new; all firearms currently microstamp unintentionally. Indeed, for over one hundred years, forensic firearm and tool mark examiners have relied on the analysis of randomly formed unintentional striations, based on the tools used to machine the firearm, transferred onto ammunition components from firearms used to commit crimes, as a way of developing clues and evidence. Intentional firearm microstamping is simply an enhanced version of a well-understood mechanical process that has been optimized and applied to firearms with identifiable micro-code structures. It is far more reliable than unintentional tool

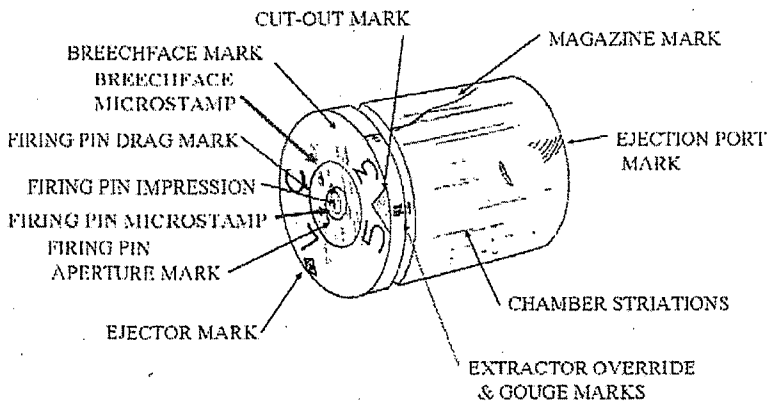
mark transfers because the intentionally microstamped cartridge features can be quantitatively analyzed, allowing for quick and direct analysis of the probability of uniqueness.

7. To ensure that microstamps are transferred reliably, each firearm model where the technology is applied is tested to determine its specific intentional microstamping geometries, such as character height, width, separation, surface finish, depth, draft angle and their arrangement within the firearm for optimum transferability and durability. Specific font structures have been created to allow for enhanced optical character recognition with microstamped cartridges. The optimization routine takes into consideration the explosive impact forces, extreme pressure, intense heat, caustic gases, violent shear and mechanical stresses that all converge simultaneously to affect the ability of microstamping features to replicate characters or encoded geometries into the targeted cartridge surfaces.

8. The optimization process uses a "cycle of fire analysis" technique. This technique maps the locations where the firearm surfaces actually come in contact with the cartridge. As shown below, such surfaces include the breech face, firing pin, ejector, magazine and extractor—all locations where it is possible to imprint microscopic characters.

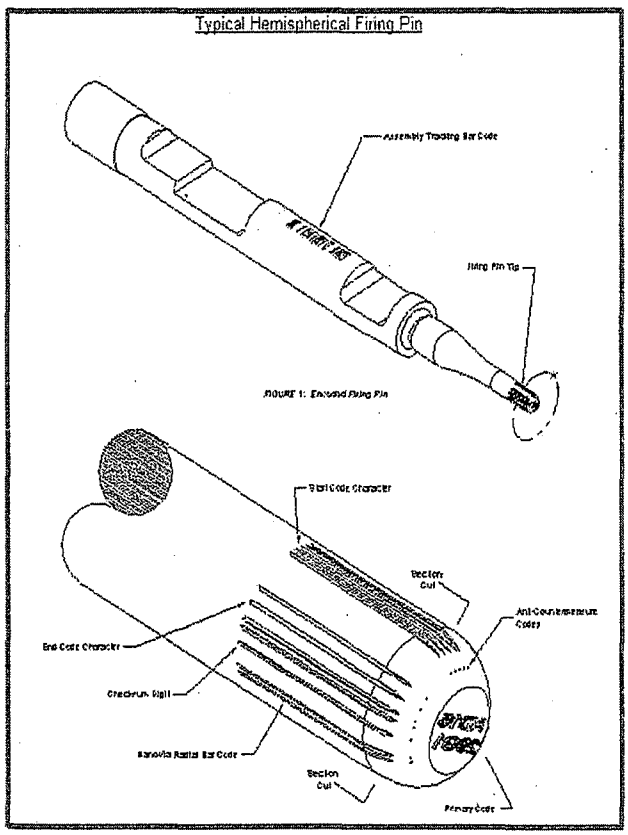
MARKS LEFT ON EXPENDED CARTRIDGE CASINGS

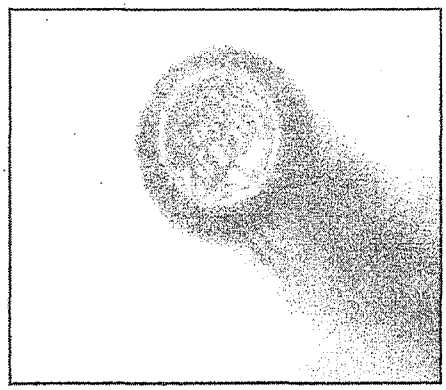
(cycle of fire marks & **microstamping marks**)

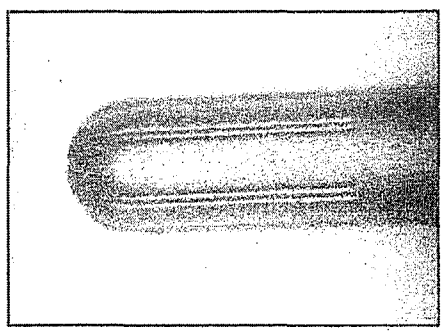


9. The primary surface utilized in microstamping is the firing pin tip. During firing, the pin tip is propelled by the hammer and embosses the primer which sets off the main charge of the bullet. It is widely understood that microscopic codes can be consistently and reliably imprinted in one or more locations on this surface. Printing two separate codes on the firing pin is feasible and enhances the readability of the microstamping.

10. By design, a cartridge has a primer in the center of its shell or cartridge casing, which is designed using soft ductile brass. The ductility allows a maximum of the kinetic energy delivered by the firing pin striker to be transmitted as a yielding strain to the interior surface of the primer beginning the chemical ignition. Increased ductility manifests itself as a deep firing pin impression and becomes a perfect location for effective intentional striated structure transfer over the largest three dimensional area possible. Below are pictures of microstamped firing pins.

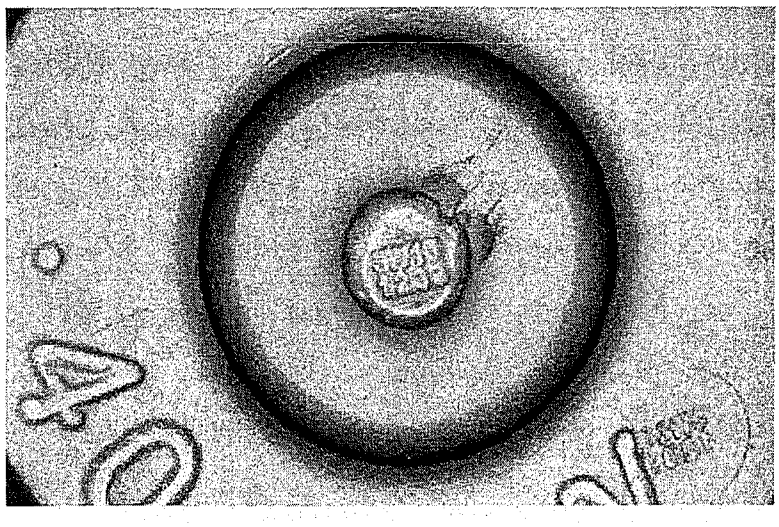






11. In a firearm equipped with microstamping, each firing pin striker carries an optimized microstructure encoded with serialized codes that identify that pin. Two separate codes are added to every pin. The center of the tip carries a code that can be read directly by examiners. The second code is found around the outside of the cylindrical area of the pin. It is manifested as a circular variable pitch gear code read by decoding. Imprinting two codes during firing provides a check against extraction accuracy and enhances readability and reliability.

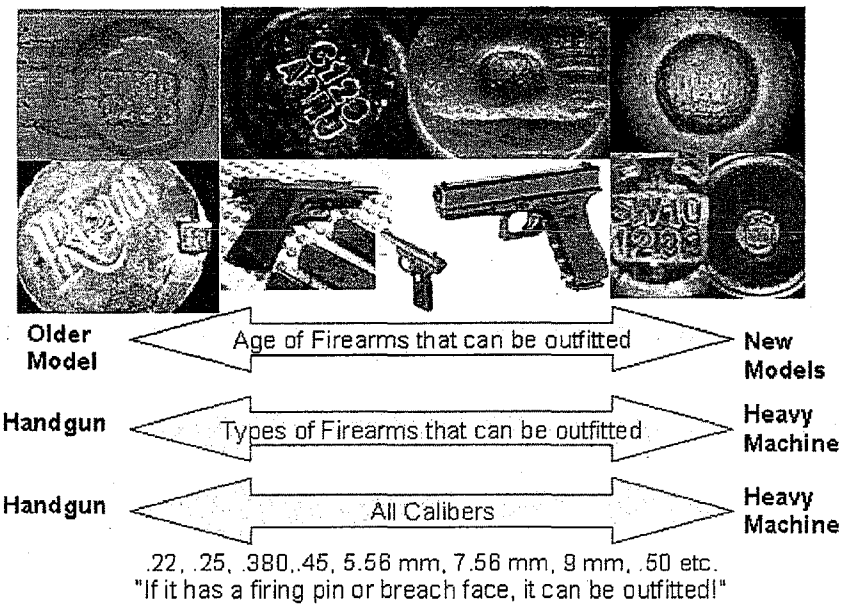
12. Another internal surface upon which microscopic characters can be imprinted, among others, is the breech face of the firearm. The photograph below shows a firearm microstamp tool mark on a primer and the breech face of a brass cartridge after cycling through an optimized firearm.



13. Although the firing pin and breech face are viable and effective locations for microstamping, various other surfaces—including the firing pin port, ejector, extractor, and chamber wall can be used. The optimum surfaces are determined based on compliance and optimization as well as the quality of the firearms components.

14. Over the years, I have conducted numerous tests on firearms such as 0.40 Cal SIG P229, 0.40 Cal S&W 4006, 0.22 Cal Ruger Mark III and other makes and models of firearms including low cost, mid range and high cost 9 mm semiautomatics to show capability across

various price and technology ranges. Shown below is a sample of various firearm microstamping impression examples, including samples from a .22LR Cal Ruger Mark III, code S12/R34 (500+ rounds); a Glock 9mm, code GLCK/8463 with the firing pin shown, (~1400 Rounds); an S&W 4006 0.40 Cal., code (SW10/1233) showing cartridge & breach face code (~5400 Rounds); 30-06 1917 SMG (>1000 Rounds); and a Colt Arms 1991 A1 Commander Model 0.45 Cal., code (C129/A3HJ) showing cartridge (~1500 Rounds).



15. Appropriate testing based on tool mark transfer methodologies has demonstrated that microstamping technology has a high level of transfer performance, survivability and repeatability. In May of 2007, for instance, I conducted a stress test in which I fired over 2,500 rounds from a Smith and Wesson .40 caliber semiautomatic handgun that had been outfitted with microstamping technology. The test employed fully optimized firing pins that were designed to work with that specific model of firearm, and used five different brands of ammunition. Using optical microscopy and scanning electron microscopy techniques, all eight microstamped digits from the firing pin were legible 97% of the time. Additionally, breech face markings transferred

to cartridge casings were legible 96% of the time. Between firing pin and breech face markings, all eight microstamped digits were identifiable in all cases.

16. As described earlier, On May 26, 2006 I conducted a demonstration of the technology at the CHP range in Sacramento, CA and on August 14, 2007, I conducted additional demonstration testing at the Los Angeles Police Academy. At each of these events, the firearms were handed to the corresponding range officers for test firing of entire magazines, where the officer would then randomly recover cartridges that would then be viewed and projected onto a screen for the public to see; all the cartridges selected by the range officers yielded a legible microstamp alphanumeric code. All of the test firearms had in excess of 1000 rounds test fired on them, which was 400+ rounds more than needed to pass the testing requirements for compliance with the California microstamping law.

17. The costs of implementation of microstamping are minimal, as only a common process already employed by industry worldwide is required to form the internal features onto the firearm. Based on my applied experience with micromachining, I estimate the approximate cost of creating a microstamp within a firearm to range between $1.50 and $5.00 per surface processed in high volume. Accordingly, I estimate that the cost of implementing microstamping elements on two surfaces of a firearm would range between $3.00 and $10.00 per firearm.

18. For the foregoing reasons, as the inventor of microstamping, it is my opinion that it is possible for firearm manufacturers to implement microstamping technology contemplated by the California legislation. Because the technology is available and feasible, the statute therefore does not amount to a ban on new semiautomatic firearms. Rather, the 20 years of development, testing and public demonstrations show that microstamping can be implemented, and will provide law enforcement a means of identifying firearms when they are not recovered at a crime scene, providing a piece of forensic intelligence in the form of a recover microstamped cartridge evidence to solve and/or deter crime and gun violence.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Executed July 7, 2014, at 2:25 pm.

TODD LIZOTTE 7/7/14