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Forensic Engineering Preparation for Daubert/Kumho Challenges

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Abstract

Forensic engineers providing technical advisories and potential testimony in cases at law are sometimes faced with motions to the court designed to preclude the consideration of their findings by the trier of fact. Quality engineering methods recognized by the profession and supported by generally accepted authority are necessary but not always sufficient components of an engineering effort capable of withstanding legal attack. Various rulings with case citations and results are presented for the purpose of demonstrating the necessity for forensic technical preparation which takes into account legal efforts aimed at preventing presentation of the results.

Introduction

Legal maneuvers designed to preclude the trial testimony of forensic experts are nothing new. What is new is the increased height of the forensic expert's threshold of trial testimony preparation and documentation since the Daubert/Kumho[1, 2] rulings and their successors. Standard engineering procedures and methods in use and in development since the mid 1800's now may come under attack by lawyers who call those techniques "junk science". When the "methodology and error rate" of mechanical dimensions and electrical parameters determined using calibrated tools, gages and instrumentation in standard ways are cited as "junk science" in legal filings, it becomes apparent that the forensic engineer must be prepared to provide by cited references, field practice and clear documentation that his analysis uses "peer reviewed data" and methods. "Peer reviewed" data that have withstood legal attack in the past include engineering texts, standard handbooks, manufacturing standards, professional society publications, industrial standards and affidavits from competent reviewing authority. Other supporting documentation with specific application to individual circumstances may also serve to validate a technical position.

The engineering report must be prepared and presented in a clear, concise and logical way with references to test results and data sources and, if appropriate, limitations imposed by necessary conditions imposed on testing and analysis must be stated along with their impact upon the conclusions of the report. Areas of engineering expertise concerning the subject matter under

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study must be within the education, training and experience of the engineer who may be called upon to prove his competence. The engineer may expect to be questioned closely at the time of his deposition concerning the "methodology" of his investigation and analysis. He should be prepared to describe in detail his assumptions and activities in pursuit of a conclusion which explains the phenomenon or incident under study. He should be prepared to explain the effect on the accuracy of the results and conclusions of an analysis that the precision of his data retrieval methods impose. A common ploy of the deposition lawyer is to question the engineer concerning "error rate" of common electrical and mechanical tests on the assumption that such a criterion has relevance to the observation that a physical condition does or does not exist. Black's Machine Design[3] presents an elegant discussion on the subject of precision of measurement and computation and their result on the accuracy of analytical results based thereon.

Another approach taken by opposing counsel is to call for random and uncontrolled test conditions in contrast to test conditions which are known and repeatable and which reproduce clearly observable conditions or results on the grounds that controlled tests are contrived to accomplish a desired result. The engineer's response should leave no doubt that unknown input parameters lead to output data with only random and questionable relationship to the input.

The determination of limiting or boundary conditions and the deliberate demonstration of a critical condition falling between those limits is one of the types of analytical methods that may be expected to be attacked based on the premise that only random and uncontrolled test parameters are valid because only then are random field conditions simulated. Whether or not collateral data is relevant to the engineer's analysis is sometimes a gray area whose breadth is widened by clients who conceal its existence for their own purposes. Relevant technical data is often obvious by its presence or absence and its importance should determine the efforts required to obtain it. If opposing counsel is able to show that not all "relevant" data has been considered no matter whose responsibility that might be, testimony that does not consider it may be questioned.

Another mode of undermining testimony is to force the engineer into a defense of how he determines the reliability of his methods and conclusions and what are the accepted norms for the determination of reliability within his discipline. Confident and professional competence coupled with the ability to respond in terms of explicit technical language supportable by reference to standard texts and handbooks should lead to the abandoning of those lines of questioning by legal practitioners.

Compounding the forensic engineer's search for written support for design techniques and priorities which anticipate and evaluate the consequences of mechanism and system failures is the omission of any such discussions from engineering textbooks, classrooms and laboratories. The "how to" aspect of the engineer's task is exhaustively treated. The "what if" aspect of his task is largely ignored. This omission opens the door to legal challenges to testimony which uses accepted engineering theory and practice consistent with fulfillment of the professional engineer's First Canon of Ethics - that the safety of the public be held paramount in all professional acts - on the basis that such an approach to the engineering task is undocumented and unsupported in the literature.

The concepts of "worse case" failure analysis and the selection of design remedies using priorities established by the potential for a catastrophic outcome of any given set of failure circumstances is likewise not a part of the standard engineering curriculum. Reference to professional section publications of the American Society of Safety Engineers and other specialized sources may contain support for positions under attack by legal counsel who claim a failure to meet "accepted practice" as they wish it defined.

It may therefore be seen that it is no longer enough for the forensic engineer to do a thorough job of gathering data upon which an analysis is made using techniques taught by accredited engineering institutions and perfected in application by years of field experience. For technical testimony to make it to trial in the face of Daubert/Kumho challenges, it must be capable of being validated by "peer reviewed" references, documented at all stages of preparation and vigorously defended all the way to the courtroom. Failure to make it past a Daubert/Kumho challenge will have repercussions as long as the forensic engineer practices because each new opposing counsel will cite the event in each and every future filing with regard to that expert's creditability no matter how irrelevant the reference might be. Since each case file is a new set of circumstances with new players and new legal climate, the forensic engineer must be ready to prepare his testimony with the expectation that it will be challenged, sometimes on the flimsiest of grounds, which if not successfully rebutted may result in the negation of the results of a perfectly valid study. The variety of content of the motions to prevent testimony often requires considerable additional research on the part of the engineer in order to counter claims of insufficiency of support for conclusions and opinions. This may occasion some significant additional expense for the client who should be advised early on of the potential consequences of an inadequate defense of technical positions.

In the writer's experience several court cases may be cited for reference with regard to successful defense of engineering analyses which have come under Daubert/Kumho attack. They are:

Flynn v. Remington[4]

Kuebler v. Remington[5]

Smith v. Ruger[6]

Fee v. Brass Eagle[7]

Phillips v. Mossberg[8]

Flynn v. Remington

In late 1996 the defendant attorneys in the case of Flynn vs. E. I. DuPont (Remington Arms) moved to bar the defect and causation opinions of four of the Plaintiff's experts on Daubert based grounds. Among others the claim was made that conclusions based on observed conditions of physical evidence and replications of the effect of debris caused impediment to the proper function of a mechanical device were invalid and would not be of assistance to the trier of fact because they were based on deductive reasoning using repeatable demonstrations rather than on the replication of presumed and random field conditions.

The facts of the case were that a young Alaskan native living in the Bethel area went hunting wild fowl with a semi-automatic Remington Model 552, 22 rimfire rifle. The rifle had been loaded with a single 22 long rifle cartridge in its chamber and the safety placed on "safe". It had then been leaned against a seat in an outboard motor boat and transported out into a wide river near the young man's village. The drifting boat was subsequently observed by members of a locally based National Guard unit on an operational exercise. When they investigated they found the young hunter shot through the neck and paralyzed. The rifle was reportedly recovered with its safety on "safe". At his deposition the young man testified that he had reached out to reposition the rifle against the seat and when he touched the barrel, it fired in the absence of contact with the trigger. Sworn testimony of others who had used the rifle established that it had a history of unexpectedly firing without its trigger being pulled and then apparently functioning normally. A design feature of the rifle is that its safety blocks only the trigger and therefore only guards against a discharge caused by a trigger pull on "safe". It does not block critical firing mechanism parts further along in the mechanical linkage which if they malfunction will cause the rifle to fire without regard to the positioning of its safety or its trigger.

When the trigger assembly was removed for dimensional study and functional evaluation it was found to be remarkably dirty with gummed residues of the WD40 which had been copiously sprayed into the mechanism as a cleaning medium. Additionally, the aluminum alloy trigger plate showed signs of repeated mechanical interference and imbedment of hardened particles of debris at a location where it would cause a 1 to 1 relationship between restriction to

motion of the foot of the sear and its upper hook connection with the hammer. Precision pin gages inserted in numerous sensitive locations in the trigger mechanism to replicate the effect of contaminants of the size and consistency of field dirt recovered from the rifle caused precarious engagement to take place between the sear and hammer which were releasable to fire the rifle when it was given very minor impacts and vibrations yielding on the order of one to two G's. For reference, a rifle with a non-resilient butt pad will experience an acceleration measured at 50 to 250 G's when dropped at distances up to 30 inches on substrates of common resiliency like carpeted or tiled floors.

The conclusions and testimony of all four of the Plaintiff's experts was that in the absence of a trigger pull with the safety on "fire", the most probable cause of the accidental discharge was the uncontrolled release of a precariously engaged firing mechanism under the influence of gummed and oxidized cleaning materials and common field dirt and debris. The precarious engagement was admitted to be of an intermittent and unpredictable nature which would not necessarily be reliably replicable under field conditions and if the malfunction were observed at any single time, the precise causative conditions would be as indeterminate as the random inputs which caused it.

The defendant attorneys took the position that only the replication of field conditions to demonstrate the malfunction would be acceptable as a test methodology and that the introduction of gages of controlled size in specific critical locations was contrived to achieve a preconceived result. Their contention was that conclusions derived from those activities were therefore invalid.

Plaintiff's attorneys responded with comparisons with failures associated with natural events such as hurricanes and earthquakes which are not fully replicable but whose effects on structures may be determined and analyzed with some precision using known material properties and structural characteristics. The use of the deductive process to arrive at probable causative conditions using well-known techniques of observation and measurement approved in numerous written court opinions was also given prominence. Considerable attention was given to pointing out the difference between theoretical scientific enquiry and the application of common engineering knowledge and industrial practice. They also noted that the Defendant's experts had not performed any of the procedures and tests called for by their attorneys and further that on numerous occasions in the past the adverse affects of gummed and oxidized cleaning materials and field dirt and debris had been admitted in sworn testimony of Defendant's experts and in internal memoranda and documentation.

The trial court denied the Defendant's motion to preclude testimony of the Plaintiff's experts. The case settled shortly thereafter.

Kuebler v. Remington

More or less contemporaneously with the Daubert based motions filed in Flynn v. E. I. DuPont, similar motions were filed in Kuebler v. Remington Arms Co. Inc. in the United States District Court for the Eastern District of Arkansas Western Division.

The facts in that case were that members of a duck hunting party in a flooded woodland near Searcy, Arkansas had taken shots at incoming birds. One hunter armed with a Remington Model 1100 12 gage autoloading shotgun had fired his gun once and afterwards placed it vertically in the crotch of a conveniently located tree after he placed the safety on "safe". While the ducks were being retrieved by other members of the party, the shotgun began to slip and fall from the tree. Its owner was observed to intercept its fall by grabbing it by the barrel. When he did so the shotgun discharged in the absence of a trigger pull with its shot charge striking a young man in the upper arm causing permanently disabling injury. When the shotgun was later recovered from under 2 to 3 feet of water at the base of the tree, its safety was reportedly found to be in the "safe" position.

Examination of the fire control mechanism in the subject gun determined that it had a sear spring with a spring constant less than that specified in Remington factory standards for the part. The light spring constant caused a lower installed suppressed force than Remington factory standards. Aluminum die cast material cut from the sear slot in the trigger plate by the hammer as the hammer was forced rearward during the automatic cocking phase of operation was found embedded in the sides of the steel sear. The sear slot itself was found to be scored in arcs which matched the imbedded aluminum residue on the sear. Clearance in the slot for the sear was measured at between .010 and .012 inch, a dimension similar to those of the gouges in the trigger plate slot left by the hammer. At the time of examination, trigger pull forces were marginally acceptable for a field use shotgun but no uncontrolled firing mechanism releases were observed.

It was the conclusion of the writer that the discharge in the absence of a trigger pull was the result of a precarious engagement of the sear and hammer caused by debris which prevented free rotation into full engagement of critical mating trigger assembly parts. Full return of the sear hook into engagement with the hammer hook was further hindered by lower than normal reset force provided by the weak sear spring. The condition causing discharge in the absence of a trigger pull would be intermittent, rare and unpredictable as to specific occurrence. Previous debris related interference between critical fire control parts unaffected by the position of the safety was clearly present.

The writer's position was supported by photographic documentation, meticulously taken examination notes and precise calculations using the examination data in classic textbook referenced relationships. Peer review in the form of affidavits by Dr. James Thompson, Chairman of the Statistics Department of Rice University and Dr. Edward Akin, Professor of Mechanical Engineering at Rice University affirmed the validity of the writer's test methods, calculations and logic used to develop the conclusions of the study.

The trial court denied the motion to preclude the writer's testimony; the case went to trial and settled at the conclusion of the presentation of the Plaintiff's case.

Smith v. Ruger

In December of 1999, the Defendant attorneys in the case of Smith vs. Ruger Arms Co. moved to preclude the trial testimony of the writer because a demonstrated condition of the subject rifle which was the basis for a recall of that model in order to prevent uncontrolled discharge was not sufficient grounds to conclude that the subject rifle might fire in the absence of a contemporaneously pulled trigger. Although the uncontrolled discharge could be replicated and was documented, the use of controlled gages to determine the critical size and location of field dirt and debris at the location at which a screw was removed by the recall was termed "junk science". The recall corrected a condition of potentially reduced clearance due to a loosened overtravel screw. The writer showed that the identical reduced clearance would result from a .014 inch piece of field dirt or debris between the overtravel screw and its stop surface.

The Defendants called for a hearing on the motion before the United States District Court for the Western District of Texas, Del Rio Division, William Wayne Justice, Senior United States District Judge presiding. The court in a memorandum opinion denied the motion to bar the writers testimony but postponed a ruling on the opinion whether the recall of the rifle by Ruger confirmed a design defect which would enable a discharge in the absence of a contemporaneous trigger pull. The full memorandum is lengthy (15 pages) and addresses in depth the questions of admissibility of the proffered expert testimony. Judge Justice and his staff took a lot of time and went to considerable trouble to outline the reasons that the rulings were made. Since most courts render a terse up or down ruling, the Smith v. Ruger memorandum is worthy of attention as an indication of judicial thought on the subject of the admissibility of expert opinion based on generally accepted practice and techniques.

Briefly, it confirms the validity and relevance of the examination techniques and logic employed to determine the most probable explanation of the event in question. The identification of modes of occurrence and their demon-

stration using standard measuring techniques in common usage is affirmed as an application of the scientific method. The term "falsification" of results was used by the court in lieu of the word "disprove" when comparing results of tests made to prove or disprove a theory under test. The court approved the "methodology" of testing because it used "peer reviewed", "generally accepted" methods and instrumentation, and had a "error rate" which while not absolutely zero was so small that it had no substantial affect on the test results and could be readily explained to the jury in such a way that it would create no confusion. Further, the test results were controllable and replicable, derived from tests which were based in the facts of the case. The court noted that the writer's testing and conclusions derived therefrom provide one of the few plausible explanations for the accident in contrast to other theories which cannot explain it "equally well". Further, the theory of discharge being challenged was essentially the same phenomenon observed by Ruger which triggered the recall of the gun, namely a reduction of critical clearances. The court in approval of the test methodology employed noted that the technique was as fully capable of disproving or "falsification" of the theory of debris presence causing critical part clearance reduction as it was of proving it and if opposing counsel cared to do so it would be "the material for a healthy cross examination".

The defense also attacked the NAFE peer review system with regard to a paper by the writer presented before the academy in which there was a discussion of the presence of field dirt and debris in firearm mechanisms which caused deterioration of their function and on occasion resulted in their catastrophic malfunction. Their position was that the NAFE was an organization that published a "journal in which Butters' article appeared is published by and for a group of engineers whose primary focus is the development of tests to determine the causes of accidental discharge for litigation purposes". Any concern regarding presumed bias and distortion on the part of the peer review process conducted by the NAFE is specifically noted by the court to be "cured by the theory's having been independently reviewed by two professors at Rice University". The court additionally noted that the application of any usual engineering technique to the investigation of a technical problem is not disqualified from consideration merely because it had not been peer reviewed because the "particular application at issue may never have previously interested any scientist".

The memorandum specifically makes a distinction between the "error rate" and statistical likelihood of occurrence of any particular event. "Error rate" as interpreted by the court is the repeatability of the test process as measured by the precision of the data derived and its relationship to the test outcome. The court concludes that "error rate" as applied to a logical and common-sense reasoning process "is simply not at issue". Calls for a testing program with innumerable random and undefined input variables "would be of little use to the

court or to a jury, given the virtual inability of any statistician to adequately control for the variables impacting the likelihood of interference".

"Contrary to Defendants suggestions, Butters' two part method, in which he first determined the most probable cause of an otherwise unexplained occurrence, and then set about finding the size of the material that could have caused such interference, is generally accepted within the scientific community. It is a combination of a commonly-used techniques of measurement and careful common-sense elimination of other possible explanations for accidental discharge. Defendant's application of an overly demanding, rigid reading of Daubert to Butters ordinary deductive reasoning should not be allowed to obscure the relevance and reliability of Plaintiffs' expert testimony".

The Defendant's motion to bar Plaintiffs' expert testimony was denied and the case was tried before a jury to a Defendant's verdict.

Fee v. Brass Eagle

In April of 2002, defense lawyers for Brass Eagle, a subsidiary of Daisey Air Rifle Company moved to preclude the testimony of the writer and Mr. David Townshend, a non-degreed forensic crime lab examiner for a variety of police departments and jurisdictions. The case was styled Fee vs. Brass Eagle and was filed in the United States District Court, Northern District of Ohio, Western Division. Its facts involved the discharge in the absence of a trigger pull of a carbon dioxide powered paint ball gun whose plastic trigger blocking safety had broken and was non-functional. Examination of the internal parts revealed a malformed steel sear with manufacturing tool marks indicating that it had been struck out of proper registration by the stamping die. Mold marks on the deformed active sear engagement surface showed no sign of having been modified since manufacture except for inconsequential localized surface polishing in service. The safety depended on a thin cantilevered extension molded into the front of the injection molded plastic trigger. With the cross bolt safety moved to block the downward motion of the trigger extension, the trigger was intended to be immobilized to stop the sear from being moved to release the striker. The extension was not only of questionable cross-sectional properties, it had a sharp change of section at its junction with the trigger body creating a textbook stress riser at the point of maximum stress. Once broken, the safety was non-functional with no external evidence that it was useless. The paint ball gun could be cocked, its safety placed on "safe" or on "fire" and then without a trigger pull or sometimes after being laid down with no human contact it would fire. With the side plate removed, the sear of the cocked paint ball gun could be seen to creep out of engagement with the striker due to the effect of the striker spring force acting against the negative engagement angle of the active sear surface.

The dimensions of the trigger extension were determined and the critical stress level at its broken interface with the trigger body was computed. Given the material properties of the plastic trigger, a prediction was made that a 10 pound trigger pull against the cross bolt safety would break off the trigger extension in as little as 3 pulls. A single .20 pound pull would break the extension the first time.

A videotape showing the paint ball gun being loaded and then discharging spontaneously was made as well as numerous photomicrographs of the malformed active surface of the sear.

Defense counsel launched their attack by claiming incompetence on both the part of the writer and Mr. Townshend. Further, the incorrect allegation was made that prior involvement of the writer in cases in which his client had not prevailed was evidence for the denial of opportunity to testify. Significantly in their motion to preclude the presentation of both experts the defense did not address their findings or their conclusions.

The Plaintiffs' counsel responded with voluminous evidence of documented demonstrated competence of both experts and provided documentation from the cases that defense had cited as evidence of prior preclusion of testimony showing that the defense claims were pure prevarication with no foundation in fact. Plaintiff's counsel also pointed out the meticulous documentation and careful data accumulation enabling an analysis of part function and strength which clearly explained the mode of malfunction of the subject paint ball gun.

The trial judge denied the motion to preclude the testimony of the writer and Mr. Townshend and then using the same standards which affirmed "the usefulness, relevance and reliability" of the Plaintiffs experts precluded the testimony of both defense experts who were noted to have performed no data determination, documentation or computations to support their claim of the absence of causative defect in the paint ball gun. Settlement negotiations which were concluded prior to commencement of trial were begun directly with Brass Eagle shortly after the judge's rulings on experts.

Phillips v. Mossberg

The most recent Daubert based challenge in which the writer has been involved was in the matter of Phillips vs. O. F. Mossberg & Sons Inc., which was filed in the 293rd Judicial District Court of Maverick County, Texas.

The facts of the case involved the reported discharge in the absence of a trigger pull of a Mossberg Model 550 pump shotgun. Upon examination, the subject shotgun was found to have broken front locator lugs for a plastic trigger

housing plate enabling a small (1/8 inch) downward displacement of the front of the trigger housing assembly. Fully seated in the receiver, the rearward motion of the bolt and its carrier as the shotgun was cycled after firing would result in the secure cocking of the hammer with a full engagement of the cocking notch of the hammer and the sear. Full downward displacement of the front of the trigger housing placed the hammer out of position far enough that an uncocked hammer would never be cocked. In an intermediate position between the two extremes a position will exist in which the hammer will engage with the sear but will not do so securely, thereby setting up a precarious connection releasable by a minor shock or vibration. If loaded, the subject shotgun will discharge without a pulled trigger whether the trigger blocking safety is on "safe" or on "fire". Due to the impossibility of visualizing the relationship between the hammer, sear, bolt and bolt carrier within the receiver, the admittedly rare and intermittent precariously cocked condition is not sufficiently controllable with the trigger housing assembly mounted in the gun so that cause and effect may be reliably demonstrated. With the trigger housing assembly out of the receiver the precarious engagement may be consistently achieved at will by carefully depressing the hammer manually and watching as the sear engages its cocking notch. Thus perched, the assembly may be reinserted into the receiver, its rear locator pin replaced and in this condition be caused to release to fire the gun when a light tap is given to it by a small screwdriver handle. This procedure was documented on videotape.

Measurements of the small plastic locator lugs on the trigger housing plate were made in order to determine how much force applied to the rear of the trigger housing as a misaligned trigger assembly is reinstalled in the receiver recess would be required to damage or shear them off. The owner's manual supplied by Mossberg tells the user of the gun to remove its trigger housing assembly for cleaning and lubrication and cautions against use of undue force without describing the potential consequences of damage to the locator lugs. Published articles from several firearms maintenance sources describe not only the observed locator lug breakage but suggest repair methods which avoid purchase of relatively expensive parts from Mossberg to repair a low cost shotgun.

The writer's conclusion was to the effect that in the absence of a pulled trigger with the safety on "fire" that the shotgun discharged due to a precariously engaged sear and hammer caused by a predictable and preventable locator lug failure on the plastic trigger housing plate. When the gun handler bumped the shotgun against his leg, he caused the release of the concealed parts and the gun fired.

Opposing counsel took issue with the technique of determining boundary or limiting conditions and the reasoning that unless otherwise specifically pre-

vented, all other conditions in the allowable excursion between the established limits are potentially possible. The writer's position was that, if potentially possible and demonstrable, on occasion any condition between the boundary conditions will occur. The attempt to preclude the writer's testimony was made on the basis that the demonstrated perched position of parts from which the gun would fire in the absence of a trigger pull was not achieved with the assembly in the gun and therefore was not consistent with the facts in the case. Complaint was also raised because firearms publications typically do not discuss product defects such as observed in the instant case. The defense took issue concerning the impossibility of determining exactly when and by whose action the locator lugs were broken although within days of the accident a gunsmith to whom the shotgun was taken identified the broken locator lugs and their potential for enabling a misfire. No attempt was made to deny the admissibility of testimony on the basis of competence. Additionally, a totally false claim was made of prior preclusion of testimony in a case in which the writer's testimony was accepted by the court but in which the writer's client did not prevail.

Response in this case to the motion to preclude testimony took the form of a lengthy affidavit in which the writer's credentials, his consideration of possible causation scenarios, the collection of data and documentation and the step by step logic by which the most probable scenario of causation were presented. Support from prior successful Daubert challenge responses were listed with explanations regarding their applicability to the case in question. Documentation refuting false claims made by the opposition were attached to the affidavit as was the original report written at the outset of the case.

The affidavit was presented to the court at 8:30 a.m., the judge ruled to deny the defense motion to preclude Plaintiff's expert testimony by 9:00 a.m. and the case settled before the close of business that day.

Conclusions

Prior success in meeting Daubert/Kumho challenges is helpful but by no means is it a guarantee of continued success. That may be achieved only by diligent professionalism, documented and reaffirmed at every step in the accomplishment of the engineering task. Even then, inadequate client support and uninformed and arbitrary rulings may result in the nullification of a perfectly valid engineering effort which will have adverse professional consequences as long as the engineer remains in forensic practice.

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5. Len Kuebler vs. Remington Arms Company, Inc. And Sporting Goods Properties, Inc. – Case No. LR-C-96-332 in the United States District Court Eastern District of Arkansas, Western Division.
6. Bruce Smith, et al vs. Darrell Abke and Sturm Ruger and Co., Inc. – Case No. DR96-CA-79 in the United States District Court for the Western District of Texas, Del Rio Division.
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8. George Phillips, et al vs. O. F. Mossberg & Sons, Inc., Mossberg Corporation, Maverick Arms, Inc. and Action Pawn, Inc. – Cause No. 02-06-18346-MCV in the 293rd Judicial District Court of Maverick County, Texas.