Accidental Nail Gun Discharge the Danger of Powder-Actuated Tools
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According to the U.S. Centers for Disease Control and Prevention, approximately 37,000 people visit the emergency room annually as a result of nail gun related injuries. That’s not firearms, but nail guns.

Unintentional tool actuation can cause severe injury and devastation. “The nail hit me knocking me backwards. When I removed my hands from my face the last thing I remember seeing out of this eye was completely blurry vision and light disappearing like going into a tunnel.” This first-hand account was given by a construction worker who became permanently blinded by a nail fired from a nail gun.

Power tools are mechanically actuated which dramatically increases the efficiency of various tasks; however, power tools are inherently dangerous and cause thousands of injuries annually. Finger and hand mutilation, sometimes requiring amputation, is the primary type of injury resulting from power tools. Some injuries lead to subrogation against the manufacturer, as insurance companies try to recover expenses paid out as a result of the injury.

In 2007, the construction equipment industry reached a peak in global sales revenue at $100 billion, demonstrating the substantial volume of construction equipment that is manufactured and sold. Although many manufacturers strive to protect users, construction equipment is responsible for a staggering number of accidents that often cause personal injury to workers on construction sites and homeowners attempting various home improvements. Construction equipment injuries range in severity and, in extreme cases, can prove fatal. Manufacturers make efforts to adequately protect the consumers that use their products and, ultimately, to limit their civil liability.

Prevention measures by tool manufacturers typically fall into three categories: safety switches, warning labels, and guards. Warning labels typically depict the appropriate usage of a tool and caution the user of improper use and the potential consequences. Unfortunately, warning labels are often overlooked by users, whether they are worn away after years of use or simply thrown away with the original packaging. Safety switches and guards offer a more definite and effective method of injury prevention because they physically prevent the device from being used in an improper or potentially harmful way. Unfortunately, some users may attempt to remove safety guards if they feel that their ability to work quickly has been impeded. Additionally, users might electrically bypass safety switches by installing a “jumper” wire across two wires associated with a given switch. Proactive manufacturers consider these possibilities and may choose to weld a safety guard rather than bolt it onto a device and also conceal safety switch wiring from plain view.

Recent forensic investigations included a series of injury cases involving powder-actuated nail guns. The devices were designed to install fasteners by initiating a firing pin when the rear of the tool is compressed. In these instances, the users were loading fasteners into the barrel when the nail gun accidentally discharged and caused extensive hand injuries. Powder-actuated nail guns, employing an explosive cartridge, are classified as high velocity guns with discharge speeds exceeding 300 miles-per-hour. Examination of the gun revealed that it had one safety mechanism designed to prevent accidental discharge. A ball-and-detent, located at the rear of the tool, prevents discharge when the tool is pointed downward, below horizontal. The ball, which
physically prevents actuation when the tool is oriented downward, moves as the tool is raised above horizontal, thereby allowing the tool to be discharged. This specific type of nail gun is commonly used with an extension pole to nail fasteners into ceilings. The gun can be loaded when pointed upward by resting the extension on the ground and loading fasteners into the discharge end of the tool. This loading position rendered the sole safety mechanism useless. Tests with an exemplar gun replicated the behavior, indicating a faulty design. There have been other similar instances of serious injuries caused by the same model of nail gun, with no record of recall for this specific model.

Secondary safety measures could have been implemented on the tool, such as a keyway lockout in the base firing mechanism or by a finger-pull firing mechanism (akin to firearms). Such mechanisms would allow the user to safely load fasteners into the tool without risk of accidental firing and the dangers therein. Incorporating a trigger mechanism would require adding a conventional trigger to the extension pole and integrating it with the device to function collectively. Another option is to institute a sequential trigger that requires muzzle depression prior to trigger depression, a method often used in other powered fastening tools. The U.S. Centers for Disease Control and Prevention estimates that over 65 percent of injuries from contact trip tools, such as this nail gun, could be prevented by a sequential-trip trigger.

The manufacturer’s website provided an online course for becoming a “certified” operator of their powder-actuated tools. The lesson offered generic recommendations pertaining to the various powder-actuated tools offered by the manufacturer, but failed to elaborate on specific safety mechanisms of the tool itself. After completing an informal exam, the examinee was certified as an “Authorized Operator of Powder Actuated Tools.” The course provided the end user with a false sense of security, believing they had complete knowledge of the tool when, in fact, they had been blatantly misled. This online safety course could have been improved by training the user on explicit safety features relating to a specific style of tool.

Even if the tool design itself is unchanged, there is a significant failure to warn users of these circumstances. Product safety of this nail gun could have been enhanced by simply describing the ball-and-detent safety mechanism to the user. Additional education in the online class, coupled with instruction in the user manual and appropriate warning labels, would have given the users a better understanding of the safety device and how to properly employ it.

Unfortunately in these cases, the tool manufacturer exhibited a three-fold failure in the design, warning, and training, which caused significant injuries to the end users. The manufacturer was ultimately held liable due to their failure to adequately protect the operator of the tool from injury.

When exploring the potential for subrogation associated with equipment accidents, it is important to note the types of safety features present on the equipment and any obvious deficiencies within the safety features. Safety agencies issue standards in an attempt to prevent injury and provide documentation that can be incredibly useful when evaluating subrogation potential. In these specific cases regarding the nail guns, the American National Standards Institute (ANSI) has defined Safety Requirements for Powder-Actuating Fastening Systems which stipulates that “The tool shall be designed to prevent inadvertent actuation.” The Occupational and Safety Health Administration (OSHA) requires that pneumatically driven, but not powder driven, staplers contain a safety device on the muzzle which prevents fastener ejection unless the muzzle is in contact with the working surface. While the tool did possess one guard against accidental discharge, vertical loading of the tool with an upward orientation was
foreseeable. Warning labels and user manuals failed to convey the lone safety guard to the operator.

It is critical that manufacturers use proactive designs to prevent injury, and provide adequate guarding where possible. In the event that a dangerous tool simply cannot be avoided, warning and training opportunities must be taken in order to prevent user injury. As Benjamin Franklin once stated, “An ounce of prevention is worth a pound of cure.”