Decades from now, we may point to a myriad of situations leading to products liability cases arising from the use of personal and service robots. With autonomous machines, products liability cases are likely to involve the apportionment of responsibility among manufacturers, software developers, owners, and users of robots. We will need to await case law development to determine how best to assess the risks of liability. Nonetheless, we can explore past cases to see the kinds of situations giving rise to suits in the past, and can anticipate similar suits in the short run. In addition, some decisions reflect intriguing possibilities of future arguments that may someday break new ground in litigation.

This summary of selected robotics liability cases highlights products liability issues discussed during the August 6, 2010 program entitled “When Good Robots Do Bad Things: Responsibility and Liability in an Era of Personal & Service Robotics.” The American Bar Association Section of Science & Technology Law’s Artificial Intelligence and Robotics Committee presented the program at the 2010 American Bar Association Annual Meeting.

This summary is not intended as an exhaustive listing of all cases involving actual or possibility liability of robot manufacturers. Instead, it serves as an overview of the kinds of cases brought against manufacturers and owners. I have also included other cases that raise interesting points about liability for failing to use robots, and cases against parties other than manufacturers in scenarios in which it is interesting to explore the liability of the manufacturers of these robots, had they been sued. I conducted the research for this paper on a legal research service, using search terms related to various theories of liability and the root “robot.”

Part I highlights robotics cases concerning issues of liability under traditional theories of products liability, such as strict liability and negligence. Part II discusses cases shedding light on defenses used in robotics cases. Part III discusses some cases deciding procedural matters in suits relating to robotics liability. The facts of these cases shed more light on possible robotics liability than their holdings relating to procedural questions. Part IV serves as a discussion of liability generally, noting patterns in the cases and drawing conclusions.

I. Cases Raising Products Liability Issues

Robotics manufacturers may face products liability lawsuits raising a number of theories, including strict liability, negligent design, negligent failure to warn, and breach of warranty. Research did not reveal a large number of decided cases involving liability issues under these theories. Nonetheless, the cases revealed by the search raise products liability issues typical of machinery used in industrial manufacturing settings.
A. **Strict Liability and Negligent Design**

A plaintiff asserting a strict liability claim against a robot manufacturer must plead and prove, under a typical state’s law, that the defendant sold a product that was defective and unreasonably dangerous at the time it left the defendant’s hands, the product reached the plaintiff without substantial change, and the defect was the proximate cause of plaintiff’s injuries. Under a negligent design theory, a plaintiff would seek to show a robotics manufacturer had a duty to exercise reasonable care in manufacturing the robot, the manufacturer failed to exercise reasonable care in making the robot, and the defendant’s conduct proximately caused plaintiff’s damages.

*Jones v. W + M Automation, Inc.*, 818 N.Y.S.2d 396 (App. Div. 2006), *appeal denied*, 862 N.E.2d 790 (N.Y. 2007), is in many ways a typical products liability case. A piece of equipment struck the plaintiff when he entered into an area behind a safety fence, and the main issue in the case concerned the existence of a genuine issue of material fact, on summary judgment, as to whether the system was defective when the defendant sold it. The equipment at issue, however, was a robotic gantry loading system used in a General Motors auto plant.

GM had purchased the system and then installed it without an interlock system to stop the machine when people are present, thereby allowing employees to work on the system within the danger zone behind the safety fence while the system was operating. Gripper arms of the system hit the plaintiff in the head while he was standing behind the safety fence and became pinned against a pedestal, injuring his head. OSHA fined GM for not installing an interlock system and for allowing employees to work behind the safety fence while the system was operating. Plaintiff sued, among other things, under theories of strict liability, negligence, failure to warn, and breach of warranty.

The court held that summary judgment was appropriate for the component manufacturer defendants under the “component part” doctrine, which states that a manufacturer of a non-defective component part of a product is not liable if its part is incorporated into another product that might be defective. Defendants were also entitled to summary judgment because the plaintiff failed to introduce evidence in opposition to summary judgment showing that the system was defective. GM’s modifications to the system were the apparent cause of the accident. Plaintiff’s expert said that the system failed to meet robotics standards of the American National Standards Institute (ANSI), but the court found that the system comported with voluntary industry standards, and the ANSI standards did not apply to the system at issue.

Similarly, other cases have found no liability when plaintiffs failed to adduce evidence of a defect. *Payne v. ABB Flexible Automation, Inc.*, 1997 U.S. App. LEXIS 13571 (8th Cir. Jun. 9, 1997) (per curiam unpublished opinion) (decedent crushed by a robot’s gripper arm in auto wheel plant while working within the “cell” in which the robot operated, with some evidence of user error). In *Payne*, the court found that the failure to meet ANSI standards, and the problems with unexpected movements, admitted by the defendant manufacturer were irrelevant, because these problems did not cause the accident. Accordingly, it affirmed summary judgment in favor of the manufacturer.

*Provenzano v. Pearlman, Apat & Futterman, LLP*, 2008 U.S. Dist. LEXIS 86098 (E.D.N.Y. Oct 24, 2008), provides an interesting “case within a case” in that it concerned a malpractice claim against a law firm that represented the plaintiff in a previous case against the manufacturer of a robotic television camera that hit her in the head in a television studio, where she worked as a hair stylist. Following a defense verdict in the underlying case, plaintiff sued her attorneys for malpractice. The court held that the plaintiff’s expert report does not raise a genuine issue of material fact to show that she would have
prevailed in the underlying suit and granted summary judgment. The report failed to explain why the accident stemmed from a design defect, as opposed to recent repairs on the camera by the studio.

Two other cases pose interesting issues regarding the standard of care for robotics manufacturers as compared to the standard of care for human operators of machines. For instance, *Arnold v. Reuther*, 92 So. 2d 593 (La. Ct. App. 1957), involved a driver who hit a pedestrian while making a left turn in his car. The court, affirming dismissal of the suit, held that the defendant driver did not have the “last clear chance” to avoid the accident, because he could not have prevented the accident after plaintiff darted out onto the street. In so holding, the court stated:

A human being, no matter how efficient, is not a mechanical robot and does not possess the ability of a radar machine to discover danger before it becomes manifest. Some allowance, however slight, must be made for human frailties and for reaction, and if any allowance whatever is made for the fact that a human being must require a fraction of a second for reaction and then cannot respond with the mechanical speed and accuracy such as is found in modern mechanical devices, it must be realized that there was nothing that Reuther, a human being, could have done to have avoided the unfortunate result which the negligence of Mrs. Arnold brought upon herself.

*Id.* at 596.

This decision raises the possibility that once we have autonomous vehicles, the courts will raise the standard of care for manufacturers to avoid collisions, since robots can act faster and more accurately than humans. Moreover, if humans’ driving record is worse than typical autonomous vehicles someday, it may even be negligent for humans to drive themselves. The more general question is whether someday failing to use a robot may be negligence.

Indeed, in one case, a court found sufficient evidence of a defect in a conventional ventilator used to supply oxygen to patients, because of testimony that the device used outdated technology and could have included a redundant backup system and robotic monitoring system. That is, the lack of such systems made the machine unreasonably dangerous. *Redfield v. Beverly Health & Rehabilitation Servs., Inc.*, 42 S.W.3d 703, 710 (Mo. Ct. App. 2001) (affirming denial of defendant’s motion for new trial) (plaintiff’s decedent died after his ventilator was unplugged and his oxygen tube was disconnected).

Likewise, in *Mracek v. Bryn Mawr Hosp.*, 2010 U.S. App. LEXIS 2015 (3d Cir. Jan. 28, 2010) (unpublished opinion), *petition for cert. filed* (No. 09-1324), a patient sued a hospital following manual surgery that resulted in alleged damages, which the human doctors performed after the hospital’s “da Vinci robot” malfunctioned and could not perform the surgery. The plaintiff in that case, however, also sued the manufacturer for providing a malfunctioning device that could not perform the surgery with the precision he needed. The decision concerned the manufacturer’s liability after voluntary dismissal of the hospital.

Although the failure to use a robot may someday create liability, the flip side is that humans may still have a duty of care to avoid accidents, even after delegating some of the operation to a robot. This liability may arise in the use of semi-autonomous machines. In *Brouse v. United States*, 83 F. Supp. 373 (N.D. Ohio 1949) (post-trial opinion), the court held that a pilot had a duty to be on the lookout to prevent air-to-air collisions while flying under “robot control” (evidently, autopilot). The Army “Black Widow” fighter struck the plaintiff’s Aeronca Cub after the pilot failed to notice it.
B. Failure to Warn

A robot manufacturer may be held liable for negligent failure to warn if the manufacturer knows or has reason to know that the product is likely to be dangerous for its intended use, it has no reason to believe that users will realize its dangerous condition, and it fails to exercise reasonable care to inform users of its dangerous condition. Nonetheless, if the danger is open and obvious, the manufacturer has no duty to warn users.

For instance, Jones v. W + M Automation, Inc., 818 N.Y.S.2d at 399, addressed the plaintiff’s failure to warn claim. The court held that the danger involved with the plaintiff of going behind the safety fence while the system was in operation was an open and obvious one. Accordingly, the court held that summary judgment should have been granted to defendants on the failure to warn theory.

C. Intentional Tort Claims Against Employers

One of the common types of case I found on my research concerned the limitations placed on the ability of an injured employee to sue his or her employer due to the exclusivity of recovery under the workers’ compensation system. Employees cannot generally sue their employers for workplace injuries if state law says that workers’ compensation is the exclusive means of recovering compensation for such injuries. Nonetheless, an exception exists if the employer’s conduct rises to the level of intentional conduct, in which case an employee can seek compensation in excess of workers’ compensation by suing their employers.


In Miller, the court affirmed the trial court’s entry of summary judgment in favor of the employer where the record showed that the decedent employee placed himself in danger of being crushed by a robot used in plastic injection molding, the employer did not know of any dangerous condition of the machine, there was no evidence of safety violations, and the employer had not inadequately trained the decedent. Under these circumstances, there was no genuine issue of fact regarding intentional conduct by the employer.

In Scott Fetzer Co., the Supreme Court of Ohio affirmed an order denying a writ of mandamus to an employer after the Industrial Commission of Ohio approved additional workers’ compensation for an employee injured by a robotic die cast machine that closed and severely injured the worker’s upper body. The employee’s job was to remove bad parts stuck in the die from the danger zone of the machine. The employer had removed safety controls on the machine and when the die unexpectedly closed, the worker sustained injury. The robotic device that normally removed good parts from the die did not always work, requiring workers to manually remove bad parts from the danger zone. The court affirmed a finding of safety violations in light of these circumstances.

In Edens, the plaintiff’s decedent was struck and killed by a robotic shuttle used to transport wool to and from dye vats. The decedent’s co-workers had disconnected safety mats that stopped the shuttle if someone stepped on them. They disconnected the mats because the repeated stopping of the shuttle “aggravated” the shuttle operator. When the decedent was checking for leakage from the vats, a co-
worker activated the shuttle, which hit and killed him. The court affirmed a dismissal of the employer and co-worker defendants for lack of subject matter jurisdiction, in light of the court’s finding that decedent was a “statutory employee” subject to workers’ compensation laws, the exclusivity of workers’ compensation, and the lack of evidence that the employer or co-workers intended to harm the decedent.

D. Causation Issues

A plaintiff suing a robot manufacturer must prove that the defect or failure to warn was the proximate cause of the plaintiff’s damages. Sometimes, the intervening act of a third party breaks the causal chain between the defendant’s act or omission on one hand, and the plaintiff’s damages on the other. For instance, misuse or modification of the product may constitute an intervening cause.

Three of the cases discussed above involved causation issues. In the da Vinci medical robot malfunction case, the court found no evidence in the record that the robot’s malfunction and failure to operate caused the injuries resulting from surgery conducted by human doctors. 2010 U.S. App. LEXIS 2015, at *5. Payne, which involved a robot crushing a worker in its “cell,” held that plaintiff failed to provide evidence that a programming error or lack of a safety feature was a proximate cause of the worker’s injuries. 1997 U.S. App. LEXIS 13571, at *7, 9. In the television camera case, Provenzano, the court found that the plaintiff failed to show defects within the television camera caused it to strike the plaintiff, as opposed to negligent repairs. 2008 U.S. Dist. LEXIS 86098, at *13, 16.

The question of causation may arise if a plaintiff tries to sue a manufacturer where, but for a robot, the plaintiff would not have been injured, but it is difficult to say that the robot was a substantial factor in the injury. In the following cases, the plaintiff did not sue the robot manufacturer, but if it did, questions of causation would arise.

For instance, in Leister v. Schwans Sales Enters., Inc., 1993 U.S. Dist. LEXIS 4627 (D. Kan. Mar. 3, 1993), the plaintiff pickup truck driver was injured while bringing fencing materials to defendant’s pizza facility for the purpose of building a fence around a palletizing robot. An employee of defendant hit the pickup with his delivery truck. The court held that the plaintiff was a statutory employee of defendant and his claims were barred because of the exclusivity of workers’ compensation.

Imagine, though, if the plaintiff had sued the manufacturer of the robot. He could claim that, but for the robot, he would not have been injured. He was in his pickup truck to build a fence around the robot. Had the defendant not purchased the robot, the plaintiff would not have been on site to build the fence, and he therefore would not have been injured. In that sense, the robot “caused” the accident. Nonetheless, such a claim would almost certainly fail, because the robot did not meaningfully contribute to the accident. Moreover, the conduct of the defendant’s employee driving the truck was a superseding cause of plaintiff’s damages.

Likewise, in Romano v. Browne, 579 N.Y.S.2d 400 (App. Div. 1992), the court reversed an order denying a landlord summary judgment for premises liability after a woman tripped on a power cord used to recharge a mail robot in the mail room. The court blamed the tenant for leaving the cord exposed and found no defect in the premises. If the plaintiff had sued the manufacturer of the robot for having a power cord that could trip people, he or she would also find it difficult to prove a design defect caused the injury.

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1 For instance, if, in Scott Fetzer, the employee had sued the manufacturer of the robotic die machine, the court may have found that the employer’s modification of the machine to remove safety guards was a superseding cause of the employee’s injuries.
Machines require power cords, and the danger of tripping is obvious. The owner of the device, the tenant in this case, has control of the device and where to place it while recharging so as to avoid hazards to those walking by. Thus, the tenant’s conduct would be a superseding cause of the injuries.2

II. Defenses to Products Liability Cases

The robotics cases I found raise four defenses to liability claims relating to the manufacture and use of robots. These defenses, of course, are only a subset of the possible defenses to a products liability claim. The most common defense was the workers’ compensation exclusivity defense, which bars an employee’s claim against an employer for workplace injuries, including those sustained during the use of a robot. In the workers’ compensation cases discussed above, the plaintiff was unable to overcome this defense.3 Nonetheless, in Scott Fetzer, the employer could not avoid enhanced compensation for the employee in light of safety violations.

Likewise, Behurst v. Crown Cork & Seal USA, Inc., 2007 U.S. Dist. LEXIS 24922 (D. Ore. Mar. 30, 2007), did not foreclose an intentional tort claim against an employer. The case arose out of an accident involving a blank transfer robot (moving metal from die to die) used in a can-making plant. Plaintiff was killed when, apparently, she was trapped in the danger zone when the machine restarted and the access door closed behind her. The court found a jury question as to an intentional tort claim against an employer in light of:

• The employer’s knowledge of the flawed performance of the machinery and a history of prior accidents.
• The employer’s alleged refusal to reprogram the machine.
• The employer’s tolerance or encouragement of unsafe maintenance practices.
• The employer’s insistence on understaffing its production line.
• The employer’s placement of the decedent alone in the production line without sufficient training.

Id. at *17-18.

The second defense raised by these cases is the component parts doctrine. Under this doctrine, the manufacturer of a non-defective component part is not liable if it is incorporated into a defective product that causes injury to the plaintiff. In Davis v. Komatsu America Industries Corp., 42 S.W.3d 34 (Tenn. 2001), the Tennessee Supreme Court answered a certified question from the Sixth Circuit and held that Tennessee law recognizes the component parts doctrine. The case involved a Sharp plant that manufactures microwaves. The system stamps out metal parts, and robots transfer the parts from press to press. Following a stoppage in the line, the plaintiff was removing a piece of metal waste when a co-

2 See also Royal Ins. Co. of Am. v. Crowne Investments, Inc., 903 So.2d 802 (Al. 2004) (reversing denial of motion to set aside default judgment after Royal failed to receive service of process when its robotic mail system malfunctioned; malfunction of the system provided a reason why Royal’s default was excused). If the judgment against Royal had been upheld, and the robot’s malfunction led to a default judgment, it is difficult to see how a court could find that a defect in robot proximately caused a default judgment. Such a result is not reasonably foreseeable for a general-purpose mail machine.

3 In addition, the Michigan Supreme Court held that summary judgment was appropriate on a manufacturer’s claim for indemnity against an employer after an accident caused by a malfunctioning robotic machine, Williams v. Litton Sys., Inc., 449 N.W.2d 669 (Mich. 1989). Given the exclusivity of the workers’ compensation system, and the lack of an express indemnity in the agreement between the manufacturer and the employer, claims that the manufacturer was entitled to implied indemnity for the employer’s failure to train the worker were barred.
worker restarted the line and a press injured the plaintiff’s hand. The manufacturer of the equipment was not liable since the machinery left its hands in a non-defective condition, and the employer had disabled a safety sensor in order to allow the equipment to operate. The alleged defects in the equipment did not concern the robots, but rather the stamping equipment.

In Jones v. W + M Automation, Inc., 818 N.Y.S.2d 396, 398 (App. Div. 2006), appeal denied, 862 N.E.2d 790 (N.Y. 2007), discussed above, some of the defendants were component manufacturers that provided non-defective products. The court affirmed summary judgment in favor of these manufacturers. Jones also involved an additional defense – subsequent modification of the equipment. The employer installed the robotic system without an interlock safety system that could have stopped the machine while the plaintiff was in harm’s way.

The final defense appears in Housand v. Bra-Con Industries, Inc., 751 F. Supp. 541 (D. Md. 1990). In that case, a mechanical arm on an assembly line for GM minivans struck the plaintiff while he was cleaning an oil spill around the machines during a work break. Someone restarted the line, and the accident occurred. The court granted summary judgment because of, among other things, the “sophisticated user” defense. Under this defense, the manufacturer is not liable for supplying a product to a knowledgeable user who has reason to know of any dangerous condition in the product. The court held that GM was a sophisticated user, GM was closely overseeing the use of the machines, and therefore the manufacturer had no duty to prevent or remedy any alleged defect. Id. at 544-45.

III. Cases Involving Procedural Issues

Some robotics cases involve claims of products liability, but the court decisions dealt largely with procedural issues. These cases are helpful in showing the factual scenarios that may give rise to liability for manufacturers. Some of these cases, though, do not shed much light on substantive questions of liability.

The claims against the manufacturer in Behurst v. Crown Cork & Seal USA, Inc., 2007 U.S. Dist. LEXIS 24922 (D. Ore. Mar. 30, 2007), discussed above, turned on a procedural issue. Even though the court denied summary judgment to the employer for the plaintiff’s intentional tort claim, the court granted summary judgment to the manufacturer. The court granted the manufacturer’s motion, because of a ten-year statute of repose that requires a product liability claim to be brought within 10 years after the first purchase, and the machine in question had been purchased 12 years before the suit was filed.

Bou-Matic, LLC v. Ollimac Dairy, Inc., 2007 U.S. Dist. LEXIS 76137 (E.D. Cal. Sept. 28, 2007), involved defective robotic dairy milking machines that allegedly did not work properly and failed to work as represented. Unfortunately, the court does not describe the nature of the alleged defects.

In any case, the California dairy company filed a state court complaint against the Wisconsin manufacturer and the California dealer. The Wisconsin manufacturer then filed a diversity action in federal court against the California dairy and California distributor seeking a declaration of rights. The question in Bou-Matic is whether the parties should be realigned to make the dairy the plaintiff and the manufacturer and dealer defendants, which would destroy diversity jurisdiction. In light of the facts and circumstances, the court did, in fact, realign the parties and dismiss the case for lack of jurisdiction.

In Bynum v. ESAB Group, Inc., 651 N.W.2d 383 (Mich. 2002), the Michigan Supreme Court reinstituted a defense verdict in a case involving an injury to a plaintiff that was operating a robotic welding system.
The court did not detail the nature of plaintiff’s claims against the defendant manufacturer. Rather, the case involved plaintiff’s claims of alleged racial biases of some of the jurors, which the court rejected.

*Rodriguez v. Brooks Pari-Automation, Inc.*, 2003 U.S. Dist. LEXIS 11146 (N.D. Tex. Jun. 30, 2003), concerned a robot the plaintiff was installing in an elevator shaft. While the plaintiff was in the shaft to communicate with co-workers, another co-worker activated the robot, which descended rapidly towards plaintiff. Plaintiff moved his body out of the way of the robot, but it severed his thumb while it passed him.

The question in *Rodriguez* was whether the Texas resident plaintiff fraudulently joined the Texas building owner, Texas Instruments (TI), in order to defeat jurisdiction. After TI removed the case to federal court, the plaintiff moved to remand. The court held that the plaintiff might have viable claims against TI for premises liability and under a contractual duty to control a contractor and make sure the contractor does the work in a safe manner. The court found that plaintiff had not fraudulently joined TI, granted the motion to remand and did not reach the plaintiff’s strict liability and negligence claims.

Finally, in *United States v. Athlone Indus., Inc.*, 746 F.2d 977 (3d Cir. 1984), the court reviewed a summary judgment in favor of a defendant manufacturer of robotic pitching machines in a case brought by the federal government following an earlier suit brought by the U.S. Consumer Product Safety Commission (CPSC). The court described the defects as follows:

> In our semi-robot age, as a substitute for the batting practice pitcher, inanimate machines have been manufactured which confront the player in the batter's box. In this case, some of the machines were defective and more wild than an erratic pitcher. In fact some of the machines were mysterious and unpredictable; even when disconnected from their power source, these machines retained such a high degree of tension in the spring and cable that with the slightest vibration, the pitching arm would unexpectedly swing forward and downward at great speed, striking any unsuspecting person within its range, allegedly causing injuries that were as serious as fractured skulls and loss of eye sight.

*Id.* at 978-79.

Unfortunately, the court did not describe the alleged defects in any more detail and did not decide the merits of the government’s claims of defects. Instead, the case turned on whether the prior CPSC action barred the government’s action seeking civil money penalties under res judicata. The court held that the district court’s summary judgment for the defendant based on res judicata was in error, because the two suits involved different conduct, different wrongs, and different evidence.

As a side note, the court stated in passing that the government brought suit against the manufacturer “[s]ince robots cannot be sued.” *Id.* at 979. The court’s assumption that robots cannot be sued is certainly true today. Nonetheless, this assumption may not hold forever, as robots become more sophisticated, intelligent, and autonomous.

**IV. Patterns and Conclusions**

The cases identified in the research show a number of noteworthy patterns. First, a substantial number of the reported cases involve robots in auto plants and those used in die press or molding equipment used to stamp out parts. It makes sense that a large number of reported cases involve these kinds of robots,
because both auto/auto parts manufacturers and companies creating metal or plastic parts using die press/molding equipment have been early adopters of robotics, the equipment used in these industries is highly dangerous to employees, and accidents involving this kind of equipment can be catastrophic. I expect that a substantial portion of robotics litigation will continue to arise from these industries in the short run. Nonetheless, over the long run, as personal and service robots enter the mainstream and are on sale in the mass market, the share of cases comprised of industrial accident in these industries will likely decline relative to cases involving robots purchased by consumers. Many more cases will arise from malfunctions or defects in personal and service robots, as the consuming public begins to use them in large numbers.

Second, a substantial number of cases in this research involved efforts by employees to obtain compensation from employers beyond that offered by workers’ compensation. State workers’ compensation systems provide compensation without the need for litigation against the employer, but also limit compensation. It is not surprising, therefore, that employees injured in accidents involving industrial robots seek to obtain extra compensation. Again, however, the percentage of robotics cases involving workers’ compensation will decline as personal and service robots become mass-market products and consumers start bringing cases against manufacturers.

Finally, these cases reflect our current times, in which personal and service robots are not commonplace household or consumer items. The cases raise some interesting possibilities that standards of care will change and that the failure to use a robot for certain tasks may give rise to liability. In the Mracek da Vinci surgical robot case, for instance, the bad surgical outcome allegedly occurred because the robot was not used to complete the surgery. As robots become better at precision or dangerous work than humans, we are likely to see more cases in which plaintiffs blame humans for not using robots.

Ultimately, the future is open as to the types of robotics liability claims we will see in future decades. As personal and service robots enter the mass market, and perform work formerly carried out by humans, we will see many kinds of claims we cannot even imagine today. We will then see courts applying and modifying old liability doctrines for use in cases involving new kinds of robots.