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PRODUCTS LIABILITY

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Abstract

This project examined the fundamental principles of products liability law and how it applies to everyday consumer products and industrial equipment. This project involved learning about the theories and practices of products liability law. Three pending lawsuits were investigated by examining actual depositions, statements, manuals, standards, and handbooks. By completing this project, our group developed an appreciation for the scope and applicability of products liability law, in terms of safety, moral principles, and business practices.

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Chapter 1

Principals of Product Liability Law

1.1 Overview of Products Liability Law

In general terms, the law of products liability concerns the manner in which to evaluate personal injury, which is a result of product use. Products liability shall be defined as liability for damages in the following context: In the case where because of a defect in the delivered product, a life, body or property of another person is injured, the person who manufactured, processed, imported or put his/her name on the product as business is liable for damages of the injured person. Products liability law can be said to employ the "liability without fault principle," that is the manufacturer is liable for damages if the injury is caused by a defect in the product regardless of whether it was his intention or fault. However, the manufacturer is not liable when there is no defect in the product.

The initial stage in analyzing a case involving products liability is to recognize precisely what is meant by the term product. By definition, the term "product" includes as many tangible goods such as automobiles, sneakers, and industrial equipment. However, the definition may also be expanded to include immaterial or intangible goods or services such as electric power.

Logically, the manufacturer of a given product may be liable for injuries occurring as a result of product use. However, there are other parties, which may be liable. In the case where a product is imported to a given area, the importer may be liable. In fact, any person who puts his name, representative symbol or characteristic marking on the product with such titles as "manufacturer" or "importer," or any person who puts his name, etc. on the product in a manner mistakable for its manufacturer or importer may be liable. Any person who, by putting his name, symbol or marking on the

product may be recognized as its manufacturer-in-fact. For example, any person, even though he puts his name on the product with such titles as "seller" or "sales agency," who is recognized as its manufacturer-in-fact or is a distributor of the product may beheld liable for damages related to the product. Additionally, any party, which is a provider of a service recognized under products liability law, may be held liable for resulting injuries caused by the service.

Recall that the manufacturer or any potentially liable party is not liable when there is no proven defect in the product. From this point it is useful to define exactly the meaning of "defect." A "defect" does not mean mere lack of quality of the product, but means lack of safety in the product which may cause the injury to life, body or property. In the law, the term "defect" is defined as lack of safety that the product ordinarily should provide, taking into account "the nature of the product," "the ordinarily foreseeable manner of use of the product," "the time when the manufacturer delivered the product," and other circumstances concerning the product. In the actual trial while the weight of each factor is different depending on individual cases, these factors are each taken into account in judging whether a given product is defective. These circumstances mentioned above include respective sub-factors, which are presented below:

1.) Meaning of "the nature of the product" -- This means the circumstances of the product itself, including factors such as the following:

a. Representation of the product (instructions, warnings, etc. to prevent accidents)

b. The effectiveness and usefulness of the product compared to its danger

c. Cost vs. effect (the safety standard of products in the same price range or class)

d. Probability of occurrence of accident ands its severity

e. Ordinary use period and durable life of the product

2.) Meaning of "ordinarily foreseeable manner of use of the product" – This means the circumstances concerning use of the product, including factors such as the following:

a. Reasonably foreseeable use of the product (intended uses of the product and predictable misuses of the product)

b. Possibility of preventing damage from occurring by the product user (recommending correct practices to reduce the possibility of misuse)

3.) Meaning of "the time when the manufacturer delivered the product" -- This means the circumstances when the manufacturer developed, produced and delivered the product, including factors such as the following:

a. Situation at the time the product was delivered (the safety level required in society at the time the product was delivered)

b. Technological capabilities of the manufacturer at the time the product was delivered

The term "defect" may also be identified in terms of type or form. Normally, three distinct types of defects are considered in products liability law: manufacturing defects, design defects, and inadequate warnings or instructions. A manufacturing defect is one that occurs when a given product is different than the rest of a given production run. For example, if a particular casting in a production run is weak and prone to

breakage, the manufacturer can still be held liable even if the instance is isolated. A design defect is a defect in which there is an inherent problem with a given final design and thus, the entire production run is defective. This would occur if a casting mold was designed poorly and every component made with that particular mold were prone to breakage. Inadequate warnings or instructions may cause a product to be considered defective because they may not warn of dangerous characteristics of the product or may cause the consumer to use the product incorrectly.

Before it can be ultimately decided that a product is defective, it must be proven that the product or use of the product was directly responsible for the resulting injuries and that the occurrence of the injuries could have been reasonable anticipated. The first of these requirements is known as proximate cause. If a given product is not the definitive cause of injury, or the proximate cause of injury, than that product cannot be considered defective. Additionally, id injuries resulting from product use cannot be reasonably anticipated or foreseen from the standpoint of the manufacturer, then a product cannot be found defective.

When assessing whether a given manufacturer is liable for injuries resulting from product use, there are three main avenues that may be considered. (1) Is/was the manufacturer negligent in producing the product (2) did the manufacturer incur any statutory violations while producing the product (3) is the product defective under the provisions of strict tort liability.

If a manufacturer is found to be negligent, then it must be proven that the manufacturer did not exercise "reasonable care" in producing the product. Reasonable care is defined as the level of care considered by a reasonable person in dealing with the

product. The manufacturer may fail to meet a reasonable standard of care at any stage in the production process, such as product design, processing, warning, inspections, packaging, and marketing.

A manufacturer may be found guilty of statutory violations if, during the production process, any applicable state or federal laws were violated. Again, statutory violations may be found in the stages of manufacturing, development of warnings, marketing or simply in the form of the final product.

Strict liability is different form negligence or statutory violations because it simply focuses on the quality of the product that caused injury. In formal terms, strict liability states that the manufacturer is responsible for a product being on the market and therefore must ensure that the product is not dangerous. From this, the manufacturer is considered to be in the best position to reduce the risk of their product, and thus it is the manufacturer's obligation to reduce the level of risk. Under strict liability, there are several implied obligations that apply:

1.) The Warranty of Merchantability – This is an implied contract or warranty that takes place between a seller and a consumer. This warranty requires products, which are sold to be of fair and average quality within their description. This means that the products should be adequately packaged and labeled, and must satisfy the statements on their container or label (if applicable). The implied warranty of merchantability applies when the seller is a merchant, or a person who has knowledge or skill about the products being sold.

2.) The Warranty of Fitness for a Particular Purpose – There are two conditions that are required in order for this warranty to be applicable. If the seller knows what purpose

the product will be used for and if the buyer relies on the seller's skill or judgment, then there is an implied warranty between the seller and buyer that the product will be fit for a particular purpose. In this case, the seller need not be a merchant, meaning that he does not have to specialize in that particular product area.

3.) Strict Tort – This states that any person who sells a product in a defective condition which is unreasonably dangerous is subject to liability for physical for physical harm to the consumer. This only applies if the seller is engaged in the business of selling a product and only if the product reaches the consumer without substantial change in the condition in which it was sold. Additionally, strict tort applies even if the seller has taken all possible care in the preparation and sale of his product and if the consumer has not bought the product from the seller.

Another category, which falls under strict liability but is not an implied obligation, is that of misrepresentation. The law states that any promise, description, sample, or model made by the seller to the buyer which relates to a product and becomes part of the bargain creates an express warranty that the product must conform to the promise, description, sample, or model. In general terms, the various marketing schemes used to sell a given product must not represent that product incorrectly or the parties involved may be held in strict liability.

To this point, only defendant liability has been considered. However, there are also instances in which the plaintiff may be found liable. This is known as plaintiff misconducts and may be divided into three basic areas: (1) contributory negligence (2) assumption of the risk (3) plaintiff misuse. Contributory negligence is defined as failure of the plaintiff to take reasonable cares for his or her own safety. This form of negligence

is based on a reasonable person standard, which means the manner in which a typical, rational individual would handle a given product. Assumption of the risk is a knowing and voluntary acceptance of an appreciated or understood risk. For example, if an individual participates in an inherently risky activity such as racing automobiles or motorcycles, he knowingly accepts that risk and its possible injurious consequences. Finally, a plaintiff may be found liable if he or she uses a given product in an irresponsible or unforeseen manner. However, if the form of misuse is foreseeable, the plaintiff may still collect damages.

Continuing in logical progression, after liability has been assessed the next step is to identify appropriate damages. In general terms, a plaintiff is entitled to recover all foreseeable damages in a strict tort product liability suit. The damages a plaintiff may collect depend on the type of tort considered. For injury to the body, a plaintiff can collect lost wages, diminished earning capacity, costs of medical care, pain, and suffering. For injury to property, a plaintiff can recover diminished value of the property, replacement costs, or cost of repair.

In many products liability suits, the injuries sustained by the plaintiff may be attributable to more than one party. The law handles multiple party cases of this type in two distinct manners. If the damages are not readily divisible between the parties, joint liability may be imposed, which would designate a single party liable for the full amount of damages. Alternatively, several liabilities may be imposed if the damages are able to be divided between the parties. In this case, each party would be liable for their appropriate share of the full amount of damages.

In conclusion, product liability law defines the legal responsibility of any manufacturer to provide a reasonably safe product to the consumer population, and to warn against potential risks of the product. A firm understanding of the implications of products liability law is necessary at each stage of production, from design, to manufacturing, to warning and instruction development, to packaging and advertising.

1.2 Products Liability References

When beginning this project, we used two primary sources of information concerning products liability law.

Lux, William J. An Engineer in the Courtroom. Warrendale, PA.: Society of Automotive Engineers, Inc. 1995.

Phillips, Jerry J. Products Liability – In A Nutshell, 4th Edition. St. Paul, Minn.: West Publishing Company, 1993.

Case # 1

Santino Dellea of Stockbridge Motors, Plainftiff

VS.

Automar New England and Northeast Lift Installer

2.1 Introduction

The plaintiff in this case, Santino Dellea and his company, Stockbridge Motors of Stockbridge, Massachusetts has filed a suit against the defendant Automar New England Inc. of Paterson, New York. In an accident with an Acanus TP9 lift, which was installed in the place of the originally order Mohawk model #LMF12, Mr. Dellea injured his arm after the lifting arms swung out from the frame of the car. It has been claimed that the accident occurred because the lift that was sold to Mr. Dellea did not have any safety restraints to hold the lifting arms in place.

2.2 Background

The Plaintiff had an agreement with Automar to have a hydraulic automobile lift installed with a set of overhead doors in September of 1992. Santino Dellea complained that the lift he had received was not the lift he had requested and that it was installed without safety arms. When Dellea questioned Automar about the lift the company representative informed him that they would order the safety after not convincing Dellea that the safety arms were not needed.

The lift that was installed in place of the one that was ordered was a used TP9 two-post lift. The lift that was originally ordered was the Mohawk model #LMF12. The company talked Dellea in to a used and reconditioned Mohawk lift, which was the model he had requested, but since it was used, the price would be much less. The lift that was installed, however, was not a Mohawk lift at all, and Dellea was unhappy about this. He contacted the selling company about this matter, and Automar claimed that the installed lift was just as good as the Mohawk because the same company made it.

On the day of the incident, Santino Dellea was working on a car that was four feet up on the lift. He took a break for about a half-hour and when he came back to work on the car he proceeded to raise the car the rest of the way. The car fell off the lift while Dellea was raising arms of the lift. The issue was that prior to the car hitting the floor the two front lifting arms flew out from underneath the car. The safety arms swung out from the frame of the car and one of them struck Mr. Dellea in the left arm, causing considerable damage to the arm. This incident was most likely a result of the safety arms not being in place. The Plaintiff's filed a complaint to Automar about the accident that

occurred and Automar failed to respond with a reasonable settlement offer. Because of this, the Plaintiff Dellea proceeded to sue Automar on multiple counts.

The first count being a breached contract because the company did not provide the lift originally agreed upon. Another involved negligence, which was brought about by Automar providing a defective lift in that the lift was installed without safety arms. The lift without the arm restraints was deemed operationally hazardous. Automar's action violated the Massachusetts Consumer Protection Law. Automar's actions constituted a breach of implied warranty pursuant to Massachusetts General Law. The installer negligently and carelessly installed the lift was the last count added to the charges. The lift was in a dangerous and defective condition. Because of these counts the plaintiff Dellea has suffered a permanent partial disability to his left arm. This disability will result in a settlement value in excess of $25,000.

The plaintiff in this case, Santino Dellea, though he was a seasoned mechanic of thirty years experience, was not familiar with the operation of the installed lift. The installer of the lift gave a quick demo of how to lift cars with the new lift. Dellea stated that he did not lift a car by himself when they he was shown but he knew the concepts. The lift installed was not the lift that was originally ordered, but the plaintiff signed for the TP-9 on the order form. The plaintiff may not have looked at the form but it was signed buy him himself. When the lift was installed, Dellea questioned that there were no safety restraints on the swing arms. When the installer was asked about this he told Dellea that the restraints were useless and that no one kept them on the lift. Dellea was upset about this and called the representative from Automar and was again told he would not use the safety arms. After "Don" from Automar failed to convince Dellea of

this, he stated that he would order the parts and have them installed as soon as they came in. He also implied to Dellea that it was ok to use the lift as it was. The installer said that Dellea could use the lift as it was as well. Dellea, not being an expert on the dynamics of the lift, followed the advise of the two men who he thought would know the most about the lift and proceeded to use the lift to run his business. The placement of the car could have been a factor in the falling off the lift arms. Dellea not being familiar with the lift or maybe being in a hurry could have lead to the lifting arms not being positioned in the proper places. This could have lead to the forcing outward of the arms, which dropped the car and injured Dellea.

2.3 Deposition of Mr. Santino Dellea

Santino Arthur Dellea has been the owner of Stockbridge motors for five years. Over the course of those five years, as owner of Stockbridge Motors, Santino specific types of business have included towing, automotive repairs, gas, and a cellular business. Santino Dellea, a mechanic with over thirty years of experience states that during this time he had never had a car fall off a lift.

When questioned, Santino Dellea said that he was familiar with the law in regards to the safety devices and safety arms that were required to be on the lift. Dellea agreed to buy a reconditioned Mohawk lift and that when it arrived it was not a reconditioned Mohawk lift, rather it was an Acanus TP9. When Santino called the owner of Automar New England, from whom he bought the lift, the owner assured him that it was a Mohawk lift that he had received. Mr. Dellea also said that on the day that the lift was delivered he realized that there were no safeties so he called and talked to the owner of Automar, Kevin, and he said that they would order the safeties immediately and install them when they came in.

Mr. Dellea said that himself; Matt and Scotty were all given an instruction from the installer about how to pick up the car. The reason for why this instruction was important was that the positioning was entirely different from that of the old in-ground lift. Mr. Dellea said that the installer, in giving the instructions, made everyone bring in a car and then explained how to position the arms. Mr. Dellea said that through experience he knew that the correct way to position the arms underneath the car is either on the frame or the lifting points. After being questioned about the absence of the safeties, the installer said that he would be back to install the safeties, but for the time being to go

ahead and use the lift because, you're not going to use them anyway, there a pain in the neck, mind as well throw them away.

Mr. Dellea said that from the time the lift was installed to the time of the accident he had used the lift about three times. When the accident occurred, Mr. Dellea said that he had positioned the arms on the frame of the car lifting points. Once he had placed the arms he then proceeded to raise the car. Once the car was lifted he said that left the car raised in the air and went and answered the phone, pumped gas, and talked to a few customers. When he was all done with this business he went back to the car and pushed the button to raise the car. The next thing that happened was the arms swung out from underneath the car sending it crashing to the ground and also causing one of the lifting arms to hit and cause serious harm to his left arm. After the accident occurred Mr. Dellea said that he took pictures and used the tow truck to get the car off the lift. He said that he would not use the lift again and that the safeties were made to prevent exactly what happened.

2.4 Deposition of Mr. Matthew Sutton

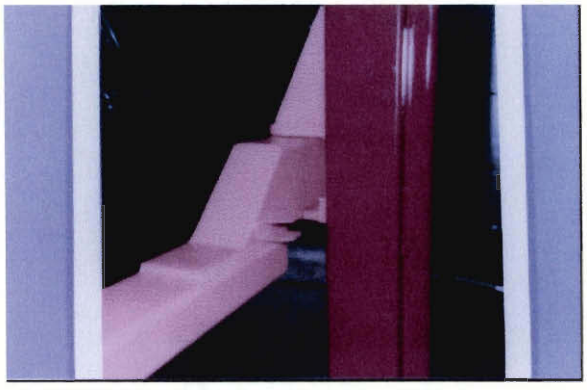
Mr. Matthew Sutton's importance in this case is that he was one of the people who was working and present at the time of the accident at Stockbridge Motors. Mr. Sutton's uncle is Santino Dellea and his mother Carol Sutton also works at Stockbridge Motors. When asked about the old lift that was replaced, Mr. Sutton remembers that the old lift was a haudralic one with a completely different design but that he never had any problems using the safeties. He recalls that prior to lifting up cars with the old lift that he would always check for placement of the lifting arms, which usually would be on the frame. Mr. Sutton said that he received instructions from the lift installer and at that time he said that he asked what the empty holes on the lift were for. The installer said that the holes were for the safeties but that most people take them off anyway because they are a nuisance and that they shouldn't worry about it. Mr. Sutton claims that they didn't have any problems with the lift prior to the accident but that the new lift was only used a little bit. Before the accident, Mr. Sutton remembers that the lift was raised about 4 ½ feet. After the accident took place Mr. Sutton aided in the taking of pictures. He said that he photographed where the safeties were supposed to be and the car in the nose down position.

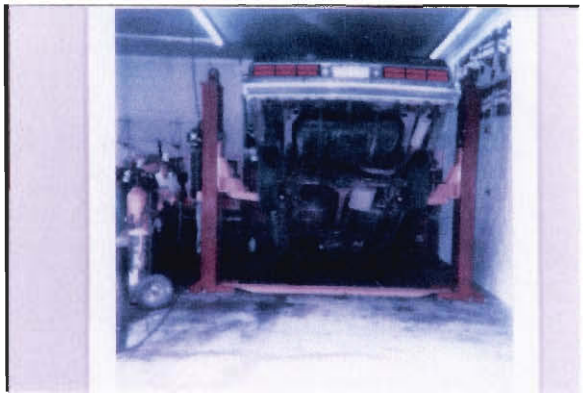
2.5 Deposition of Mrs. Carol Sutton

Mrs. Carol Sutton has been employed at Stockbridge Motors for about 14 years. In that time as an employee she has had the responsibility of bookkeeper, secretary, clerk, and handy-lady. Mrs. Sutton said that her brother had told her that he was going to buy a Mohawk lift from Automar. However, she was unaware that they received and Acanus lift rather than the Mohawk. On the day that the lift was installed she said that she overheard discussions about the safety features of the lift. She also heard the installer say that the safeties weren't there and that most people took them off anyway, they weren't necessary. Mrs. Sutton will testify that the lift arm that swung out from under the car hit both Santino Dellea and the wall.

2.6 Analysis of Pictures

These two pictures show the actual lifting arms of the lift. The pictures also help to show that there were no safety restraints in place. It also shows where the restraints should have been.





Theses two pictures show the car after it fell off the lift. The above picture shows how the lifting arm swung out and hit Mr. Dellea from his working position on the left. The bottom picture gives a better picture of how the arms swung out and the damage that was caused due to the lift.

2.7 Inspection of ANSI Standards

The problem that comes about in this case with the ANSI standards is that at the time when the lift was built, 1984, it met the standards that were needed for that time. However, at the time when Mr. Dellea purchased the lift, 1992, it was reconditioned and therefore should have met the new standards that ANSI required. Those standards were that there needed to be safety restraints to prevent the arms from swinging out from underneath the car.

2.8 Conclusions

After review of this case, we feel that the defendant was at fault because they produced a hydraulic automobile lift without safety restraints for the arms. The safety restraints are designed to aid with the stopping of an incident like this from happening. It is also clear that the Acanus lift that Mr. Dellea purchased was unsafe without the safety restraints and that it violated the ANSI standards. It is also clear to see that the defendants should not have told Mr. Dellea to use the lift without the safeties. Rather, they should have told him that the lift was unsafe and that he should wait until the safety restraints were in place. We do not know for sure that the safeties would have helped. We also don't know if the accident was the fault of Dellea himself. From the evidence at hand we must conclude that the accident happened at the fault of the Automar Company. Though we do not know exactly how to put a price on the loss of function of an arm, a substantial amount of money should be awarded to the plaintiff for his suffering.

Case 2:

NAPCO Corporation, Plaintiff

VS.

Brunswick Corporation, Defendant

Golf Club Plating Machine

3.1 Introduction

On March 23, 1992 the Brunswick Corporation placed an order for a golf club plating machine. NAPCO, a specialist in this type of machinery was hired for the job. The machine that would be designed and installed by NAPCO would plate a golf club shaft with first a coating of nickel and then chrome finish over top. The cost of the machine would be $1,561,605.00. The machine was brought to the Brunswick factory and installed. The plating machine was run by the Brunswick Corporation, but soon many complications arose. There were many problems with the machine, which NAPCO sent out repairmen to fix. The problems were fixed, however, they reoccurred shortly thereafter. Other problems occurred with the plater as well. Technicians from both companies attempted to fix the machine but to no permanent avail. The machine was breaking components which it need to run, namely two heavy-duty chains that raised the elevator which dunked the club shafts. Eventually, the shaft that these chains ran over snapped and this caused a huge problem.

3.2 Background

On March 23, 1992 a purchase order was signed by the golf division of the Brunswick Corporation. The order was for a chrome and nickel plating machine that would accomplish many assigned tasks. First the plater would put a coat of nickel on the shaft of a golf club, and then a chrome finish would be put over top. Also built into the contracts were provisions for the machine to be operable and reduce "down time." The machine was designed by NAPCO, a specialist in plating machines of this type, from a standard plating machine design that they use. The company would take their existing design and from that, they would retrofit it to the needs of the purchaser. The cost of the machine agreed upon was $1,561,605.00. The case is a suit by NAPCO against the Brunswick Corp. because due to the failures of the machine, Brunswick refused to pay the full amount agreed to. The amount paid was $1,399,220.00. The Brunswick Corp. felt that it should not be responsible for the complete payment because the constraints, on which the contract was based, were not met.

In this case the plater that was purchased did not meet with all the guidelines specified in the contract. The guidelines, which were not met, dealt with the functionality of the machine and the operational up time that a machine of its quality should give. The machine had many problems from the start. Technicians from the NAPCO Corporation were fixing the machine all the time. Many little things would break making the machine inoperable. The plater did not meet the contract in three main ways. First, the plater was defective. The machine did not meet the obligations and performances agreed to, which deemed the machine "unfit for use". The attempts to repair the machine over an extended period of time had failed. The second noncompliance was that the plating machine, did

not meet the expressed warrantees stated in the contract. These were: superior design feature, durability, structural integrity, low maintenance, and operational up time. The machine was supposed to be "free of any defects in material and workmanship." The third obligation not met by NAPCO was the fact that the machine was for a particular use and the Brunswick Corp. hired the experts of NAPCO to choose the correct machine for the job. The machine delivered was not good for this purpose.

Events leading to shaft failure:

The problems with the plating machine ultimately lead to the failure of the shaft on which the triple sheave assembly rode. The events that lead up to the failure of the shaft are as follows: The chains on the machine were of size AL-844. These chains had the ability to hold 32,000lbs; three times the weight of the elevator. The chains rode over a triple sheave assembly. There was a problem from the beginning with these chains. The chains would stretch causing a problem with the sheave assembly. A misalignment of the sheave, and an overloading caused the failure of these chains. The chains were subject to forces that exceeded their capacity, and they broke several times. The solution to the breaking problem was to get heavier duty chains to hold the load. These chains would be able to withstand the load placed on them by the elevator.

The chains rode over a triple sheave assembly. The sheave was attached to a shaft that ran between two pillow block bearings. The sheave was held in place by two locks, one on either side of the sheave. The problem with the chains also caused a problem with the sheave. The sheave would wear due to a friction force that exceeded the expected load. A combination of misalignment and lack of lubrication helped to cause the problems. The alignment of the sheave would not be correct because it would walk out of

place. Attempts to try to stop this walking were unsuccessful. The walking of the sheave caused it to become misaligned with the lubrication brush. Thus the chains were not lubricated properly and there was an increase in friction. Many solutions were attempted to stop the sheave from walking. As with the chains, the misalignment, poor lubrication, and overloading caused the problem with the sheave. The final solution was to offset the sheave so that it would be in proper alignment.

Shaft Failure:

The shaft on which the sheave rode snapped during operation of the plating machine. At the time this occurred, the sheave had been oriented in an offset position. This was seen as a way to correct the alignment of the chains. The chains used at the time were of size BL-866, much stronger that the ones previously used. The force applied to the shaft now exceeded that which it could hold, because the new chains could now withstand the force on them. The shaft broke, but it was still attached to the chains. The chains pulled on the broken parts of the shaft and caused it to destroy the right pillow block bearing as well.

3.3 Deposition of Max D. Caldwell

Mr. Max D. Caldwell is the president of NAPCO Inc. of Terryville, CT. NAPCO is a subsidiary of the Thermo Electron Corporation of Waltham, MA. Mr. Caldwell has Bachelor's Degrees in Mechanical and Electrical Engineering. As well as a Masters Degree in Mechanical Engineering, concentrating on automatic control systems. Before this plating machine, which his company had built, Caldwell had had only one previous experience with electroplating. At NAPCO, as president, he had an involvement in the design of the plater.

As well as having to do with the design, as president of NAPCO, Caldwell handled the purchase order from Brunswick golf pertaining to the plating machine, which was ordered. He stated that he had reviewed the terms and conditions of the purchase and then signed and filed the acknowledgment form. However, he also stated that he did not agree with the terms but no evidence of this existed. On a typical acceptance form appears the statement," Bt acceptance of this order, seller agrees to and shall be bound by all terms and conditions of this order including these on the rear side thereof, and it is in full compliance with the federal price standards of the federal counsel on wage and price stability." There was nothing that stated Caldwell did not accept the terms of the purchase stated by Brunswick Corp.

Once the machine was delivered and installed at the Brunswick factory and the problems began to occur, Caldwell sent repair people to the site to fix the machine. The machine was fixed numerous times, however problems kept occurring. A retired expert on plating machines, who worked for NAPCO for years, was sent to look at the machine and evaluate it. Caldwell states that he said they were doing all the things he could think

of to repair the machine. He recommended a larger chain size, which had been discussed by the staff of NAPCO previously. And with the larger chain must be installed a larger brush to lubricate.

3.4 Deposition of Jeremiah S. Gourd

Jeremiah S. Gourd of Goshen, CT, is the director of Steel Shaft Manufacturing and Process Control at Brunswick Golf in Torrington, CT. Mr. Gourd has a Bachelor of Arts from New England College. As stated by himself, he has significant exposure to plating processes, specifically electro plating. Steel is brought into the Brunswick plant where it goes through a series of tests to first assure its proper alloy. Then the steel is formed into a shaft and eventually is put through the plating machine to give it its final finish.

The first problem Mr. Gourd spoke of was the current fluctuation problem, which occurred in the machine. This led to poor plating of the club shafts. The immediate answers to the problem were to tighten loose nuts and bolts but racks were found to be missing insulators and there was a problem with spring mechanisms. Gourd stated that other areas that could cause fluctuation in voltage are: poor rack design, poor rack construction, poor frame construction, and poor assembly techniques of any conductive area. NAPCO had to deal with these problems first in the whole picture.

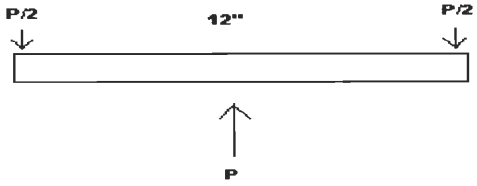
The next problem was that with the elevator chains. The original system consisted of a chain that was stressed to elevate the platform. Several chains were broken because the chains could not withstand the stresses being put on them by the elevator as well as other factors. Other factors would be misalignment of the chains due to walking. Other complications are the lack of lubrication and wear on the chains. The new system was described by Gourd as an entirely different system, much better than the original. The new system required chains that were 1 and 7/8 the width of the other chains. The wider chains distributed the weight better, however, they transferred all the stress to the triple

sheave assembly and ultimately the shaft. Gourd also expressed problems with the lubrication system, which was modified by both NAPCO personnel and Brunswick technicians. Some links were still not getting the lubrication they needed and the result was stiff links. There was also a chain stretch problem that was stated by Gourd. "The machine requires much more maintenance than the other three combined," according to Gourd.

3.5 Discussion

This accident was caused by a fatigue failure in the shaft, which held the chains for the elevator. Cyclic loading of a shaft or beam, which ultimately leads to a fracture, causes fatigue. On our shaft, there were two areas of interest that could be seen on the broken shaft. A smooth appearing area is a result of minute cracks. Figure 1 shows the two areas of the broken shaft. Over time, the strain on these cracks increases. At the tips of these cracks, the stress increases over time and the cross-sectional area gets smaller to a point when the load cannot be sustained. A brittle fracture can now occur. The area on the shaft, which seems to have the texture of sandpaper, shows what a brittle fracture looks like.

We calculated the loads on the shaft.



The static weight on the shaft is 7,590lbs.

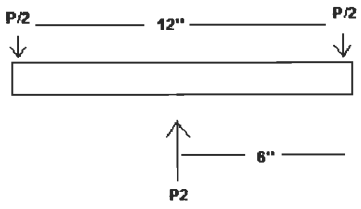
M = -3,795 (0.5)

= 1,897.5 ft*lbs

$$\sigma = M\rho / I \qquad I = \frac{\Pi D^4}{64}$$

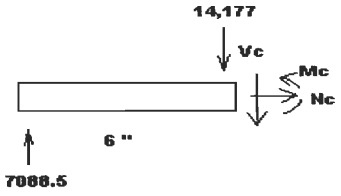
= 30,573 psi

Calculating the stresses for the dynamic weight, we found:



P2 = 14,177lbs

Therefore the force acting in the vertical direction on each end of the shaft was 7,088.5lbs



We then calculated the moment on the beam where it snapped.
M = 0 : Mc + 7,088.5 (0.5) = 0

Mc = -3,544.25 ft * lbs

The shaft failed because it was subject to bending at a rate, which it could not withstand. The endurance limit of the shaft was breached and the shaft broke. The endurance limit is know as the limit below which no evidence of fatigue failure can be detected after applying a cyclic load. To test the endurance of a shaft such as the one we studied, we would have to use many specimen of the same lot of production. We would

have to subject them to a cyclic loading of a specified stress and repeat the loading until fracture. The results could then be plotted for analysis.

3.6 Photographs of Key Elements

Figure 1:

Figure 1 shows the two areas of the broken end of the shaft. The smooth area, at the top of the shaft pictured, is due to fatigue and constant cyclic loading. The rough area is from brittle fracture.

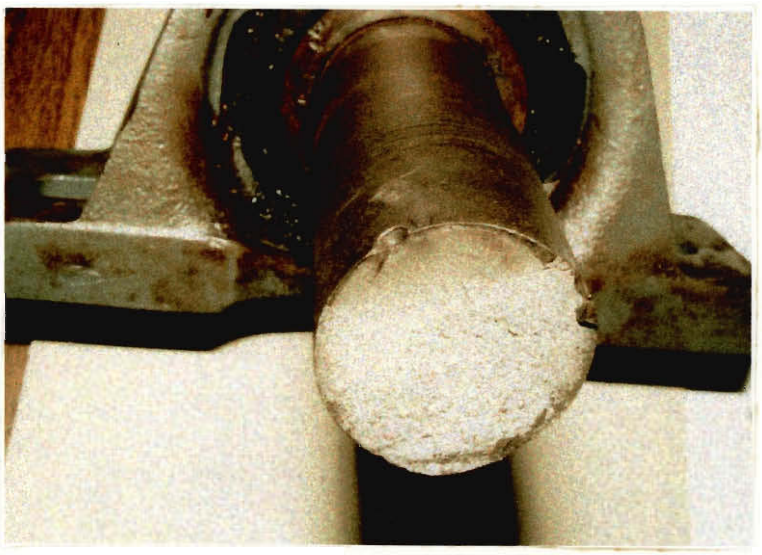


Figure 2:

Figure 2 shows the sheave and shaft assembly as they are on the working machine.

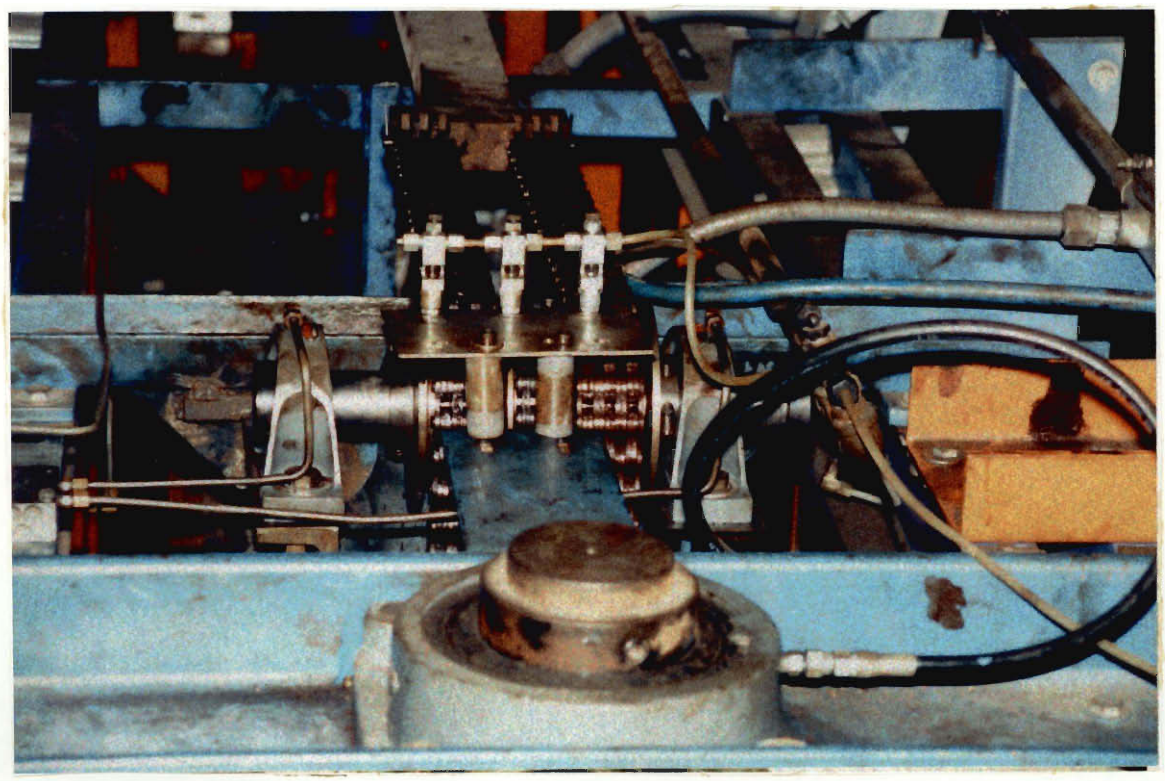


Figure 3:

Figure 3 shows the right pillow block bearing, which was destroyed after the shaft broke due to the chains still exerting a force on the broken pieces of shaft.

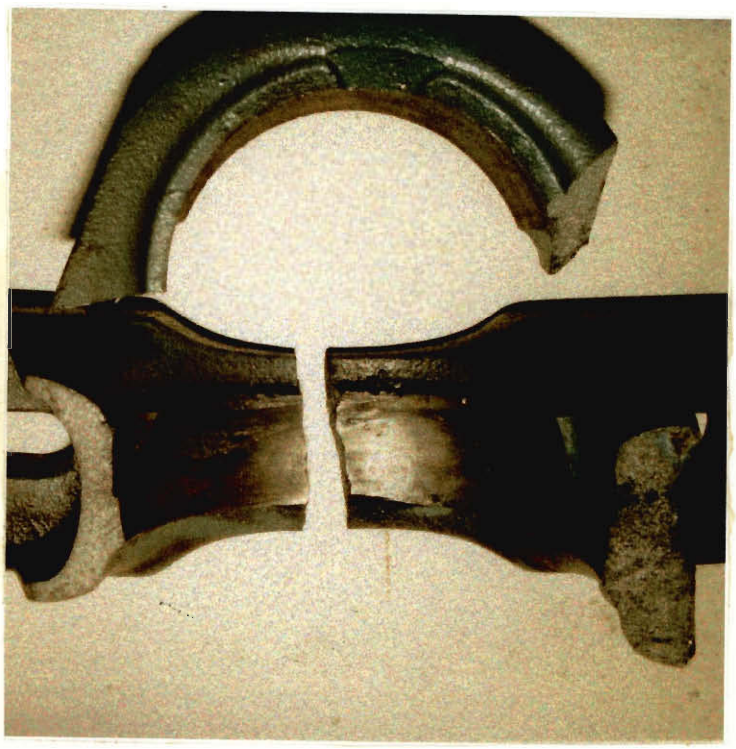


Figure 4:

Figure 4 shows one of the chains, which broke due to the combination of poor lubrication, misalignment and exertion of too great a force. You can see form the picture that some links did not receive proper lubrication. This resulted in a number of stiff links that would not move.

3.7 Conclusions

We have concluded that the shaft on which the sheave and chains ran snapped due to a flaw in the machining process. A nick out of the shaft caused stresses to be greater at that point than on the rest of the shaft. The shaft was subjected to cyclic loading and this caused a fatigue failure of the shaft, which brought the plating process to a standstill. We feel that Brunswick Corporation should be refunded money from the purchase of the plater, however, that is not the case. Judgment in this case should be for the defendant and they should not have to pay the rest of the cost for the plater.

Case 3

Brenda And Barton Ankenman, Plaintiffs

VS.

Web Press Corporation., Defendant

Printing press injury

4.1 Introduction

Barton and Brenda Ankenman vs. Web Press Corporation vs. Clevenson Corporation. This case involves an accident that occurred on March 24, 1993 in which Barton Ankenman, a pressman, accidentally got his hand caught into one of the six units located on the Web Leader Press machine. The plaintiff's party has claimed that the Web Press Corporation was negligent for these specific reasons:

- Negligently designing, manufacturing and selling a printing press with an inadequate guarding system.
- Failing to provide a proper guarding system as standard equipment on the printing press to prevent the user's fingers from being drawn in between the ink roll and plate cylinders.
- Failing to prevent, by mechanical means or otherwise, the plaintiff's hand from entering the area between the ink roll and plate cylinder.
- Failing to provide proper warnings, communicating the danger, the nature of the hazard, the risk of serious personal injury or death and the means to avoid the hazard.
- Failing to provide instructions and warning in the use of the product and method and manner of operation.
- Negligently failing to provide a proper guarding system as standard equipment upon the subject press.

Web Press has a counter suit against Clevenson Corporation. They are going to try and prove that Ankenman was not properly supervised during his accident.

4.2 Background

The machine that was caused the accident to Barton Ankenman in this case is called the Web Leader Press. The machine primarily consists of six perfecting printing units and one quadra-color common impression unit. The basic function of this machine is to produce newspaper print. This machine was designed and manufactured by a company called Web Press Corporation located in Burlington, Vermont. The Web Leader Press was designed to provide a total press system that achieves high quality, accessibility, fast no tool set-up, quick start-up, folder accuracy, and low waste. These are what each component of the Web Leader, that Mr. Sam Clevenson purchased, consists of, according to the Web Press advertising team:

6 – Perfecting printing units, each complete with:

- Running sidelay and cicumferential register adjustment for each plate cylinder
- Silencing and timing clutch
- Harmonic ink feeding system
- Ink and water fountain shut-offs independent of feed settings
- Individual ink, water and impression throw-offs
- Compensator for color or cut-off adjustment
- One full set blankets and covered for all web leading rollers
- Connecting floor plating and drive
- Bruch dampening system

1 – Quadra-Color four color common impression units equipped with:

- Running sidelay and circumferential register adjustment for each separate cylinder
- Running skewing adjustment for each plate cylinder
- Silencing and timing clutch
- Harmonic ink feeding system
- Ink and water fountain shut-offs independent of feed settings
- Individual ink, water and impression throw-offs
- Compensator for color or cut-off adjustment
- One full set of blankets and covered rollers installed on the common impression unit
- Anti-offset covering for all web leading rollers
- Connecting floor plating and drive
- Brush dampening system

2 – Heavy-duty folder to produce half and quarter folds, each equipped with:

- Two large driven RTF rolls
- Double diameter tucking cylinder
- Single diameter knife and jaw cylinder
- Variable speed extended delivery table
- Tabloid slitter

- Anti-offset covering for web leading rollers
- Connecting floor plating and drive

2 – Variable speed 50 hp DC main drive and associated control systems requiring 460 V AC, 3 ph, 50/60 Hz supply, including gearing for a maximum speed of 20,000 products per hour and including:

- Circuit checking system to simplify maintenance
- Tachometer calibrated in products per hour
- Electric good copy counter
- Operator's control station
- Startup delay and warning bell

1 – Twinning cross drive between lines I and II, to permit synchronized or independent operation of each press line.

7 – Roll Positions, each complete with:

- Automatic tension control system
- Disc brake and hydraulic damping
- Three air shafts for each two positions

2 – One-ton hoist, trolley, and yoke for roll loading

2 – Stop/safe/slow pushbutton stations mounted on rollstands

10 – Tidland air shafts

2 – Pair unit washup devices

3 – Recirculating fountain solution system with tank, pump, filter, and factory installed piping within units

2 – Direct litho compensators on 3rd unit from folder

52 – 6" water stops

4 – Color web lead brackets

6 – Stop/safe pushbutton stations mounted on units

1 – Full set Baldwin washup devices on Quadra-Color unit

1 – Direct litho compensator for Quadra-Color (4th deck)

2 – Keylock electric counter in addition to good copy counter

2 – Quarter-fold seam moistoner

3 – Stop/safe/inch pushbutton stations mounted on folder and Quadra-Color

1 – Class I & II spare parts package

1 – Double-ended plate bending and register notching fixture

All – Automatic grease lubrication of running gears

4 – Handwheels

1 – Set of perforators at the nips

This Web Leader Press was sold by Web Press with an option of buying aisle guards to come with it. The price for each guard was $315.00/per Perfecting unit. That added up to a lot of money so the President of Clevenson Corporation, Sam Clevenson,

decided to not go for that option. The guards were not a necessity according to Web Press so Mr. Clevenson went ahead and just bought the machine. Mr. Clevenson did feel that added protection should be there in case of an accident so he bought some much cheaper guards from a company called Rand Manufacturing. These guards were very easily removed off of the units on the Web Leader Press. This is where the claim comes in. It is felt by many that the Web Press Corporation should have designed guards that came with the machine and automatically stopped the machine when removed. This would have prevented the accident that happened to Mr. Ankenman's hand.

4.3 Deposition of Barton Ankenman

Barton Ankenman started his pressman career at World Printing. He did work there four about four years. He first started out as a jogger for about one year. He then became second pressman and got a raise. His responsibility as a second pressman was to assist the lead pressman and run the machine.

Mr. Ankenman then moved on to become a pressman at a company called Hoffine Press. His responsibilities at this job were to oversee the entire crew and make certain that the job was getting done correctly.

After this Mr. Ankenman took a step down and became second pressman at a different company called Winn Press. He was very happy with his position and responsibilities at this job. He did not stay very long at Winn Press. He decided that he was going to try and go back to World Printing.

When Mr. Ankenman finally got back to World Printing a.k.a. Clevenson Corporation he would not be very happy either. The company had him as a second pressman at first. Through hard work and diligence, Mr. Ankenman finally got what he always wanted and became first pressman. Mr. Ankenman had not been very impressive though. He had received two separate warnings for tardiness.

On day of the accident March 23, 1993 at approximately 4:50 p.m., Mr. Ankenman was nearing the end of his shift. He saw that there was a hickey forming on one of the rolls. So he decided to use the short cut that was supposedly common practice to remove the hickey while the machine was moving. There were guards on each of the cylinders. These were the very inexpensive guards that Mr. Clevenson had purchased from Rand Manufacturing. He purchased these guards because he felt there would be

protection from people who accidentally got their hands caught in the cylinders. These guards were very easily removed. That is just what Mr. Ankenman had done was remove the guard and proceed to try and remove the hickey from the plate cylinder with a piece of film. Mr. Ankenman pleaded that he really knew what he was doing.

As he proceeded to try and remove the hickey, Mr. Ankenman heard a loud bang come from across the other side of the factory. This noise distracted him and caused him to lose concentration on the task at hand. A portion of his left hand got caught between the ink roll and plate cylinder. Mr. Ankenman was in an enormous amount of pain but still was able to reach around the cylinder and hit the stop button. He was unable to jar his hand loose so he yelled for help. His supervisor, Michael Adesso, proceeded to take the unit apart to release his mangled hand. He was then rushed to the hospital.

The guards that were on the machine were definitely inadequate. The basic goal of these guards was to prevent strangers from walking by and touching the cylinders. The product was improperly designed, as there was no proper guarding system to prevent the plaintiff's hand from being drawn in between the ink roll and the plate cylinder. A proper guarding system should have been standard equipment on the product.

As a result of the accident Mr. Ankenman suffered the following injuries:

- Crush/degloving injury of left hand
- Significant tissue loss of skin on palmar aspect of left extending to the proximal volar wrist crease
- Exposure of flexor tendons in the wound
- No flexion or extension of left fingers or wrist
- No sensation in third, fourth and fifth digits

- X-rays revealing radial styloid fracture, fourth metacarpal base fracture and displaced fractures of the second – fifth proximal phalanges
- Significant skin avulsion over left palm and bases of digits extending to distal wrist crease with flaps distally based; significant deformity of all digits; significant numbness and decreased sensation in all digits
- Fractures of all phalanges, multiple displaced and angulated; metacarpal fourth base fracture and hamate fracture
- Extensive debridement and irrigation of left hand and wrist, open reduction internal fixation of proximal phalanx fracture of index with two pins; open reduction internal fixation of proximal phalanx left middle finger with two pins; open reduction internal fixation of left ring finger proximal phalanx with two pins; open reduction internal fixation of left little finger proximal phalanx of left little finger proximal phalanx with four C-wires; debridement of avulsed flexor sheaths of index, ring and middle fingers and debridement of contaminated flexor tendons with partial excision of contaminated tissues; loose closure of multiple skin flaps in hand and closure of complex skin lacerations of index, middle and ring fingers; insertion of a penrose drain and drainage of carpal tunnel with insertion of distal forearm catheter for Marcaine block
- Bruising and contusion of nerves at MCP joint are
- Avulsed ulnar digital artery to middle and ring fingers
- Repeat irrigation and debridement of left hand
- Fever/nausea and vomiting
- Small open area of index finger

- Joint stiffness debridement of necrotic skin
- Bone loss, primarily in little finger, proximal phalanx/bone deficiency
- Crepitus in fingers
- Inability to close hand/weak thumb motion

The list goes on and on. This is just a few of the injuries he suffered just to give an idea of what he deserves for damages. The bottom line is that Mr. Ankenman will never be the same after what happened to him on March 23, 1993 at approximately 4:50 p.m.

4.4 Depostition of Sam S. Clevenson

Sam S. Clevenson is the President of Clevenson Corporation, which also does business by the name of World Printing. His corporation was formed in 1986 and was dissolved in 1996. He was Barton Ankenman's boss at the time of his accident and he was also the person that purchased the Web Leader Press. He purchased the press for a total of $689,500 brand new.

Mr. Clevenson supposedly did not know what an aisle guard was when asked by the attorney for Web Press. It was never implied that he had to purchase any type of guard for the Web Leader Press, as it was only an option. He did end up purchasing a total of 16 guards from a different company. The company he purchased the guards from was called Rand Manufacturing. He purchased the guards because he felt that "added safety" was needed.

Mr. Clevenson was asked if there was any training given to his employees on how to run the new Web Leader Press. According to Mr. Clevenson there was training provided to his employees by a Mr. Hinkens. Mr. Hinkens was the person that installed the Web Press Machine. When Mr. Hinkens provided the training, Mr. Ankenman had not been an employee of the Clevenson Corporation yet. In fact, when Mr. Ankenman was an employee there was no evidence of anyone properly training him. The only known instruction given to Mr. Ankenman was over the materials, the regular guidelines and the rules and regulations of the shop. Michael Adesso, his immediate supervisor, would have given these at the time. Mr. Ankenman had been a pressman prior to his employment at Clevenson Corporation so he already knew how to run machines like the Web Leader Press.

Mr. Clevenson went on to talk about the process of removing a "hickey". A "hickey" is a spot of dust or a piece of lint or newsprint on one of the rollers of the machine. The result is the ink does not work.

Mr. Clevenson's employees are not supposed to be messing around with presses that are in operation. People are not supposed to be attempting to make adjustments, like removing hickeys, to machines like the one Mr. Ankenman had his accident with. The correct procedure to use is to stop the press and use the inch mechanism to make the correct adjustments. There were, however, instances in which he observed, people removing hickeys from moving cylinders.

Mr. Clevenson again goes on and talks about the guards. An important part of this deliberation is when Mr. Clevenson talks about how Mr. Hinkens, the man who installed the press, told him that there was no need for guards on this press. If there were no need for guards on the press there would have been any instances like the one that happened to Mr. Ankenman. So there obviously was a need for guards on this machine.

During the time of the accident, Mr. Clevenson was in a separate building. When he heard of the accident he rushed to the hospital. When he got there he held Mr. Ankenmans hand to comfort him. It was obvious to Mr. Clevenson that he was in a lot of pain and agony. It was then that Mr. Clevenson was told how the accident occurred. He was told that Mr. Ankenman tried to clean a hickey or a piece of dust while the machine was running and his hand got caught in one of the cylinders.

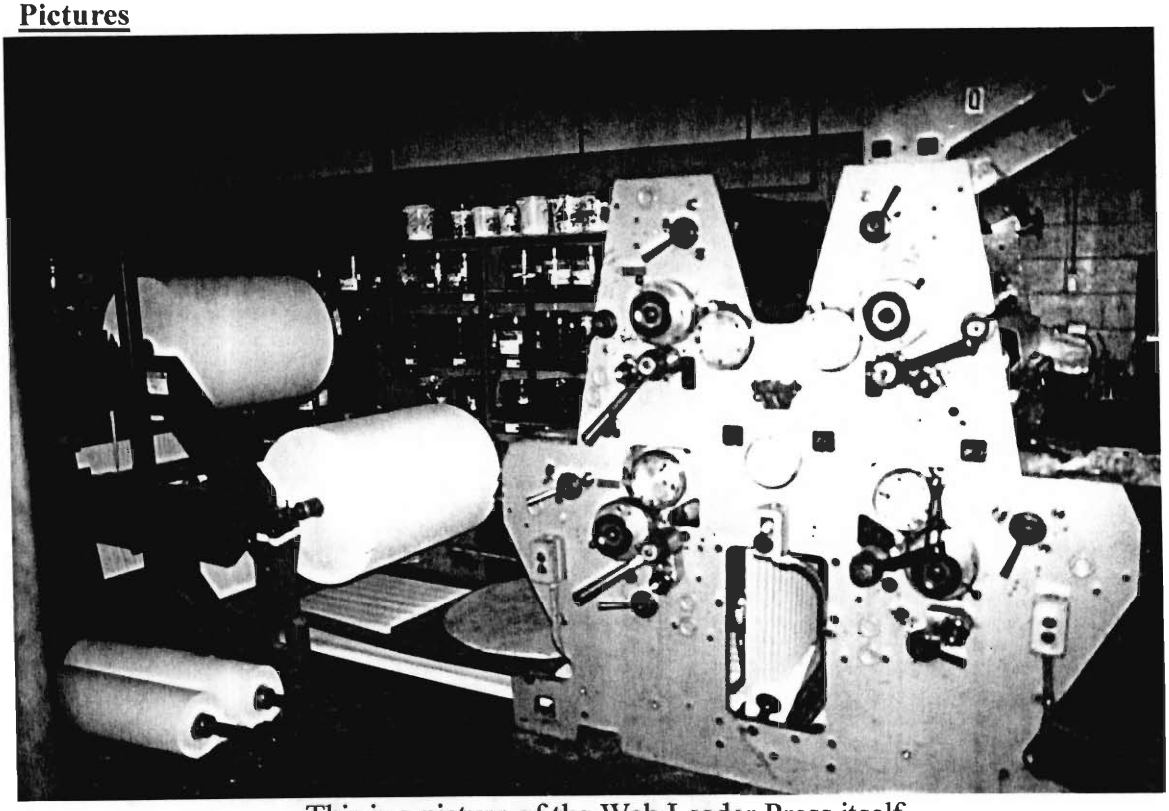
4.5 Discussion

In our group's discussion we decided that we felt Barton Ankenman was 20% at fault and Web Press was 70% at fault. We also feel that World Printing is 10% at fault. Akenman is at fault because he failed to do his job by the rules. Even though it was common practice to remove hickeys while the machine was moving he still did not follow the rules. Mr. Ankenman knew the correct way to remove the hickey he just decided to use the shortcut. Because he did not use the proper procedure, his hand is permanently disabled.

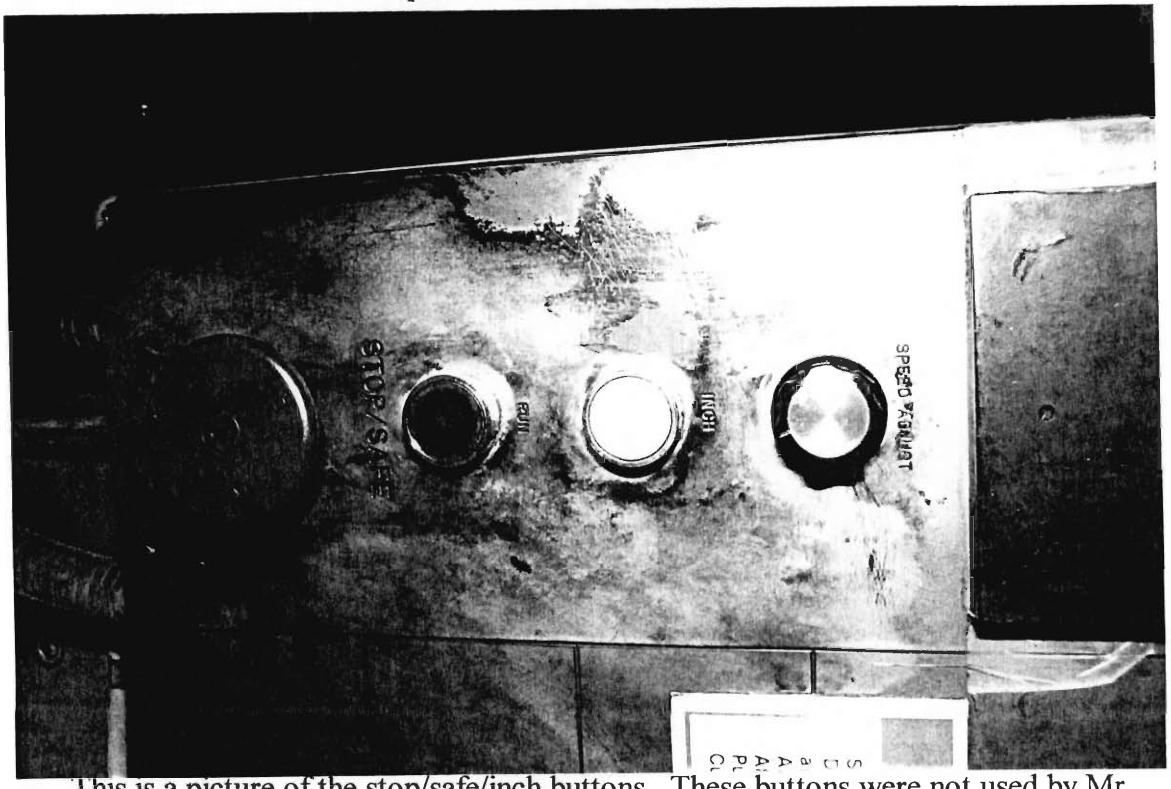
According to OSHA standards they are legally not at fault. However, we do feel that Web Press is at fault because by product liability law, Web Press delivered a defected press. They delivered a product that has the potential to cause harm. According to expert witness Gerald C. Rennell, the subject press was not reasonably safe and was defective in that there was no proper point of operation guarding system to protect the user from the in-running nip point hazard. We agree with him in the fact that the in-running nip point should have been guarded with an interlocked, barrier guard and the press should have had a crawl/inch button, which would have enabled the operator to "jog" the press in order to locate and remove the hickey.

We also feel that World Printing is at fault for not properly enforcing the rules on how to correctly remove hickeys. There was a supervisor on board. He obviously was not doing his job. He should have been able to see Mr. Ankenman improperly remove the hickey and stopped from doing it before the accident happened.

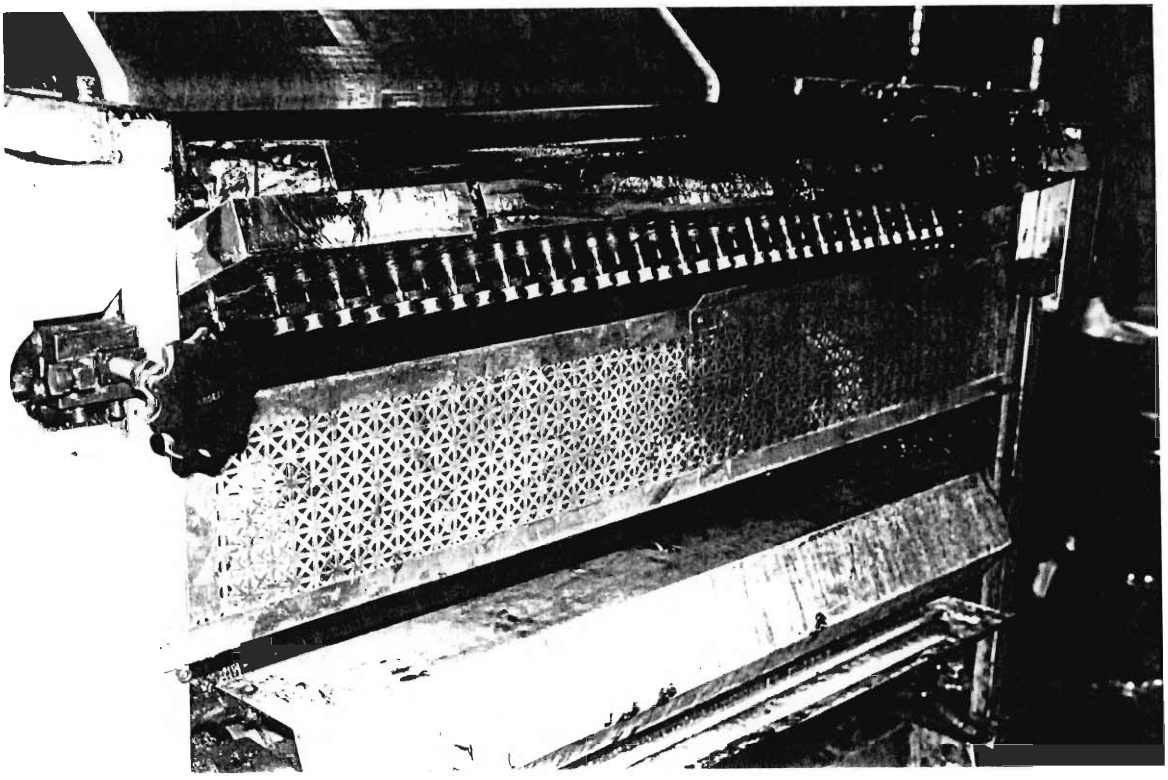
Pictures



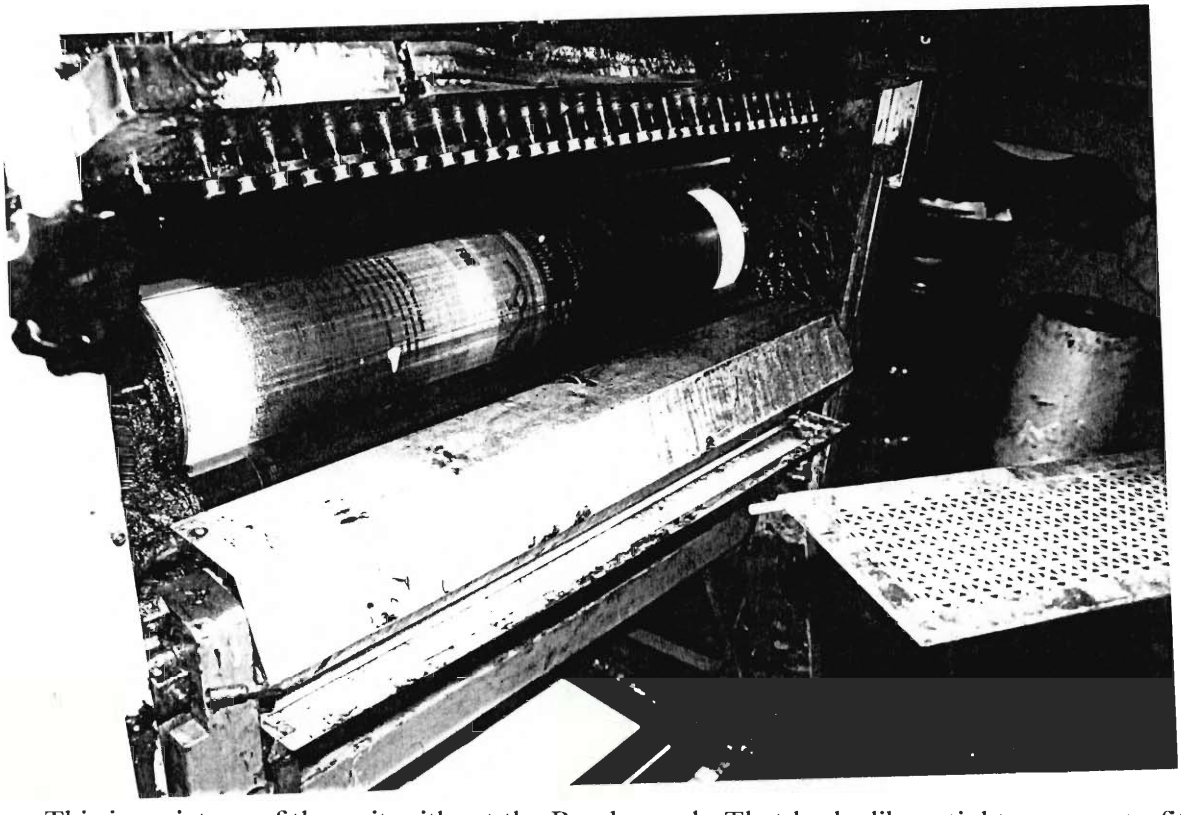
This is a picture of the Web Leader Press itself.



This is a picture of the stop/safe/inch buttons. These buttons were not used by Mr. Ankenman when he decided to clean the hickey.



This is a picture of one of the units. It could be the unit Mr. Ankenman got his hand caught into. This is the guard that World Printing bought from Rand Manufacturing.



This is a picture of the unit without the Rand guard. That looks like a tight squeeze to fit a hand into.

This is a picture of the safety instructions that Mr. Ankenman failed to follow.

This is another picture of safety instruction. Notice how it says Caution to Avoid Serious Injury. Mr. Ankenman did not follow these and he got seriously injured.

4.7 Conclusion

After reviewing the case of Barton and Brenda Ankenman vs. Web Press vs. Clevenson Corporation, d/b/a World Printing, we have concluded that the evidence supports the plaintiff Barton Ankenman. Even though Ankenman is slightly at fault, it was proven that Web Press did in fact design a press that was not reasonably safe. They also did not provide an adequate guarding system to come with the machine. There were only optional aisle guards. Mr. Ankenman should be entitled some money for damages and suffering. We also feel that World Printing should pay Web Press for poor enforcement of the rules and regulations in the use of the Web Leader Press.