IN THE DISTRICT COURT OF OKLAHOMA COUNTY

STATE OF OKLAHOMA

BETTY L. BENNETT, as Guardian for and on behalf of Jerry L. Bennett, an incompetent person,

Plaintiff,

vs.

HESSTON CORPORATION and WOODS DIVISION OF HESSTON CORPORATION, CENTRAL OKLAHOMA EQUIPMENT COMPANY; FORD MOTOR COMPANY,

Defendants.

CJ-86-6473

* *

DEPOSITION OF FRANKLIN J. APPL

Taken on Behalf of the

Plaintiff

on March 28, 1988

in Oklahoma City, Oklahoma

* *

APPEARANCES:

For the Plaintiff:

MR. ROBERT D. TOMLINSON
800 City Center Building
Oklahoma City, OK 73102

For the Defendants:

MR. DALE RENEAU
800 - One Leadership Square
211 North Robinson
Oklahoma City, OK 73102

Reported By: Carol Marie McClure, C.S.R.

For the Defendants:

MR. JOHN A. KENNEY
10th Floor
Two Leadership Square
Oklahoma City, OK 73102

EXHIBITS

STIPULATION

It is hereby stipulated and agreed by and between the parties hereto, through their respective attorneys, that the deposition of FRANKLIN J. APPL may be taken on behalf of the Defendant, on this, the 28th day of March, 1988, in the City of Oklahoma City, Oklahoma, by Carol Marie McClure, Certified Shorthand Reporter and Notary Public within and for the State of Oklahoma; pursuant to notice of the taking of said deposition having been given.

It is further stipulated and agreed by and between the parties hereto, through their respective attorneys, that all objections to questions propounded and answers thereto made, except as to the form of the question or the responsiveness of the witness's answer, may be made at the time of the trial when said deposition is offered in evidence with the same force and effect as if said objections were made at the time of the taking of this deposition.

It is further stipulated and agreed by and between the parties hereto, through their respective attorneys, that the time of the filing is waived.

It is further stipulated and agreed by and between the parties hereto, through their respective attorneys, that the witness may read and sign this deposition.

And thereupon, the following witness was produced by the Plaintiff:

FRANK APPL,

the witness hereinbefore named, being first duly cautioned and sworn to testify the truth, the whole truth, and nothing but the truth, testified on his oath as follows:

DIRECT EXAMINATION

BY MR. TOMLINSON:

Q State your name for the record, please.

A Franklin J. Appl.

MR. TOMLINSON: Do you have a curriculum vitae or something like that, that you could fork over?

MR. KENNEY: I didn't bring one with me. We can get one---

MR. TOMLINSON: Why don't you send us---

MR. KENNEY: ---and send it to you.

BY MR. TOMLINSON:

Q What's your opinion about the cause of this accident, Mr. Appl?

A In my opinion, the cause of this accident is the negligence of Mr. Eennett in *getting* under a rotary mower which was suspended on a hydraulic three-point hitch on a tractor when he had been instructed not to get under the rotary mower unless it was blocked up.

Q Do you have any other opinion regarding the

cause of this accident?

A It would be my opinion that the rotary cutter probably drifted down, as opposed to dropping suddenly.

Q Any other opinions that you have regarding the cause of this accident?

A it would be my opinion that Mr. Bennett got under the rotary mower to remove a tangled cable or to take a nap, and that the rotary cutter either drifted down on him over a long period of tine or persons known came by arid activated the three-point lift control on the tractor, which would have allowed the rotary cutter to descend,

Q Do you have any other opinions concerning the cause of this accident?

A I think that's ail.

Q Do you need to look at any of your notes to review what you did and make sure that's all before we go on, in order to make sure that I've got a complete answer?

A I believe that's all my opinions on that particular point.

Q Okay. Upon what do you base your opinion that Mr. Bennett crawled underneath the mower to take a nag?

A If you will recall, I said that he either crawled under to remove a tangled cable or to take a nap.

I don't know which he did.

Q Okay. What I'm interested in is your opinion of what is most probably the reason he crawled under the mover, if you have such an opinion.

A I would say that it is most probable to me that he went under to disengage a cable. However, the length of time that is required for this rotary cutter to drift-down causes me some concern as to why he would stay under the cutter that long, if he was conscious of what was going on.

Q What if he wasn't conscious of what was going on, would that then resolve your concern over why he would remain underneath it for the length of time necessary for it to loner and trap him?

A No.

Q Can you explain your answer?

A Well, ----

Q What is the reason that it would not relieve your concern over the length of time, if in fact he was not aware that the mover was slowly coming down?

A I just don't believe it's possible that Mr. Bennett had been a rotary cutter operator for a number of years and not be aware that tho three-point hitch will drift down.

And in addition to that, my understanding is

that he had been directly warned by his direct supervisor on one or more occasions not to get under the rotary cutter without blocking it, and that it could drift down onto him, if he did get under it without blocking it.

Q So you're saying you don't think it's possible that he would have been unaware?

A No. I don't think it is possible for him to be unaware.

Q And my question was: If in fact it turned out that he was unaware, if there is evidence to support that and if you were asked a hypothetical question, if you assume that he was not aware it was drifting down on him at the time, would that explain why he stayed under there so long?

A That could be a possible explanation, except the rate of drift is slow enough that he should have sensed that it was coming down in time to remove himself.

Q So do you think at the time he first felt the pressure from a portion of the mower on his body, he was unconscious or inattentive or what?

A I would say he was either highly inattentive or asleep. I don't know which.

Q Or the same?

A Pardon?

Q Or they could be both the same?

A Yes.

Q Do you have an opinion as to whether it's more probable that the mower drifted down, or that a third party activated the control lever?

Which of those two options that you stated is most probable, in your opinion?

A From the depositions that I have read, it would seem to me that It is more probably that it drifted down.

Q Upon what do you base your opinion that it drifted down rather than dropping suddenly?

A I base that on the deposition that I have read in which no one indicated that anyone was around the unit other than Mr. Bennett.

Q Well, that would explain why you think no third party activated the lever; right?

A Yes.

Q My question is, your third opinion that you stated was that you believe that the mower drifted down rather than dropping suddenly. By giving me that answer, are you telling me that the only way it would drop suddenly is if the lever were activated?

A That's the only way that I have found that it would drop suddenly.

Q Is there anything else that you base your opinion upon that it drifted down rather than dropping

suddenly, other than the absence of people within close proximity to the lever?

A Well, I base that upon my examination and testing of the unit, In which it didn't drop, but it would drift down slowly.

Q Upon what do you base the conclusion that Mr. Bennett was instructed to block the mower up before doing maintenance underneath it?

A I based that upon the testimony of Mr. Thomas and, I believe, Mr. Layman.

Q And you're talking about their depositions where they testified to that?

A Yes, sir.

Q Anything else you base that upon?

A I don't understand that question.

Q Is there anything else, other than those two depositions, upcn which you base your opinion that Plr. Bennett was instructed to block the mower up before working underneath it?

A I don't believe so.

Q What was the negligence of Mr. Bennett, in your opinion?

A The negligence was his action of placing his body under a rotary cutter which was being held in a raised position by a hydraulic three-point hitch, with

the tractor engine not running when he knew and had been told that he should not place himself under the rotary cutter without blocking the rotary cutter up.

Q Do you know if he was told why?

A I don't recall that, but I know there is some testimony of that- in Mr. Thomas's deposition. But I don't: recall it at this moment with enough specificity to say.

Q Where, in your opinion, was Mr. Bennett caught by the mower'.

A Apparently, and again based upon reading the depositions cf the various co-workers that gathered at the accident scene immediately after the accident, Mr. Bennett was caught on the right side of the mower, with his head closer to the tractor than to the rear of the mower, and with his head, right shoulder and right arm, and possibly part of his right leg under the right side runner of the rotary cutter such that the runner came down across h s chest and his left shoulder or left side of his neck.

Q Or left side of his work?

A Neck.

Q And when you say right side of the tractor, are you talking about as seated in the operator's scat?

A Yes.

Q Or looking in the direction the operator looks?
A Yes.
Q Okay. In your opinion, the edge of tho mower frame went across his right leg--thigh or calf?
A I have nc idea. That was not stated. Some witnesses were not even sure that it went across his right leg.
Q Chest?
A Yes.
Q And his right shoulder?
A No, sir.
Q Left shoulder?
A Left shoulder.
Q Was his head underneath the mower, or did the frame of the mower come to rest on his head?
A I believe the most of the witnesses thought that his head was underneath the runner. I don't recall anyone saying that the runner was on his head.
Q What was the thickness of Mr. Bennett's chest?
A I don't know,
Q Do you have an approximation a3 the thickest part of his body that the runner was resting upon?
A I would assume the thickest part of his body would be his chest, but what that dimension is, I don't know.

MR. TOMLINSON: Off the record.

(Whereupon, a discussion was held off the record.)

BY MR. TOMLINSON:

Q Back on the record. Okay. On the right side of the mower, do you have an opinion as to how much clearance there was between the pavement and the right edge of the mower frame in the fully-raised position immediately prior to the time Mr. Bennett crawled underneath it?

A I can only give you the results of my measurements which were made on the 14th of March of 1988, which would indicate that there was a clearance of approximately ten inches at the front of the right runner, and thirteen and a half inches at the rear of the right runner of the rotary cutter while it was in the fully-raised position.

I haven't had a chance to study them, but apparently those dimensions are seasonably close to what was shown on Mr. Powers arid his examination of August, 1984.

Q Is it your opinion that Mr. Bennett's chest was closer to the ten-inch dimension, or the area of the mower that had the ten-inches of clearance, than it was to the thirteen-inch dimension?

A I don't have sufficient information to make

that statement at this time.

Q Have you looked at any anthropomorphic figures to determine what the average person's chest dimension would be of Mr. Bennett's size and weight?

A No, I haven't.

Q Do you have an opinion as to how far down the edge of the mower ha? to drift before Mr. Bennett was caught?

A No, I don't have an opinion about that at the present either,

Q Do you have an approximation?

A No.

a Well, let me ask it this way, if Mr. Powers is correct that it drifted an inch in a minute and a half, and if Mr. Bennett's chest was more than nine inches in dimension, isn't it most likely that he was there less than a minute and a half before he was caught?

A Well, in your hypothetical---

Q I'm sorry. I didn't mean to say less than nlne inches, I meant to say nine inches or more. I don't know which I said, so let me restate the question,

A Well---

a Isn't it true that if Mr. Bennett's chest dimension was in excess of nine inches as he lay flat on his back, if the clearance underneath the right front side of the

mower was ten inches, as measured by both you and Mr. Powers, and if It would drift down one inch in a minute and a half, then Mr. Bennett could have been under the mower for less than a minute arid a half before he was caught?

A Under the assumption of the facts as you have stated them, and if all of those dimensions and chest measurements are correct:, then that would be also correct.

Q Do you know what your chest dimension is?

A No, I really don't. I never---

Q We could stretch out on the table here and measure it, couldn't we?

A 'dell, I don't know.

Q I'm *just* wondering if nine or ten inches is reasonable for the thickness *of* a man's chest the size of Mr. Bennett.

A I don't know. I have not gone into that area of chis accident.

(Whereupon, Plaintiff's Exhibits 1 and 2 were marked.)

BY MR. TOMLINSON:

Q Okay. Could you identify Exhibit 1 *to* your leposition?

A Exhibit 1 *is* a listing of the depositions that have received and have read.

Q Would *you* identify Exhibit 2 to your deposition?

A Exhibit 2 consists of a collection of notes made during my examination arid testing of the subject tractor and rotary cutter, which was done on March 14, comma, 1988; a graph which I prepared showing the relationship between the drift and the passage of time for the rotary cutter; notes made during the examination of another tractor, a Ford tractor, with a long reach rotary cutter that is owned by the City of Oklahoma City; notes identifying the date of final assembly of the subject tractor; and then Xerox copies of decals from the subject tractor and from the rotary cutter; and a copy of a page from the operator's manual for the subject tractor,

Q Are these items that you prepared in connection with this case and for this deposition?

A Yes, sir.

Q 'Where did you get the model and serial number?

a I beg your pardon?

Q The model ani! serial number on page 1 of Exhibit 2, where's you do that?

A Off of the manufacturer's plate on the subject tractor, located under the right hood of the tractor.

Q How did you know you had the right tractor?

A It was indicated to me by Mr. Kenney that this was the tractor and the rotary cutter.

Q And I guess *you* must believe him to be a reliable source?

A Yes. Just in case, though, I checked the Oklahoma City unit number against the police report.

Q And what did you find?

A They were the same.

Q Okay. How about the rotary cutter? How do you know it's the correct one?

A I was told that by Mr. Kenney.

Q Did you check that?

A No.

MR. KENNEY: Also, for the record, Mr. Thomas brought it out to us, and I don't know, did he tell you whether or not that was *it?* Did you talk to *him* directly?

THE WITNESS: I don't think I asked him a direct question. It was my understanding that I was going there *to* look at the equipment involved and that's what he brought out, so I assumed that that was the one.

BY MR. TOMLINSON:

Q Page 2 of Exhibit 2 is a listing of dimensions between the ground and the right rear and the right front over a period of time; is that correct?

A Yes, sir.

Q And page 3 *is* the same thing with somebody jumping up and down?

A I was jumping up and down on it, and---

Q Is this depicted in your film?

A No. And I was making the measurements at the middle bolt-, on the right side.

Q Okay. Page Number 4, documents a video tape of the test of drift of the three-point hitch with the engine off where you're measuring the distance from the bottom of the runner at the second bolt on the right side to the ground over time; is that correct?

A Yes.

Q Is that your opinion as to where he was located as the bottom of the runner at the second bolt on the right, side?

A I would expect that that part of the runner would have been on his body if, in fact, he was located as tne witnesses have described. I did not have a definite location where he was along that right side.

Q In the graph--the next page is a graph of the distance from the bottom of the runner at the second bolt on the right side to the ground; is that correct?

A Yes.

a And you got the measurements the next day on 3-15 of the tractor with a long reach rotary mower which had a clearance height of 40 inches, and you measured it over 15 minutes' worth of time; is that correct?

A I believe that's correct, if that's what's Indicated there.

Q it had a descent rate of three and a half inches per minute, approximately, the firs!: time?

A The first one I didn't make any notations, but after I observed what it was doing, I ran *it* back up and did make notations, which *is* the second test there.

Q Of what significance is this test--to this case?

A The only real significance would be that it is an indication that all hydraulic systems would drift under load and this was a unit purportedly operated by Mr. Bennett so that he would have been aware of the drift on another unit, as well as the subject unit.

Q How do you know he would have been aware of it?

A I just don't believe chat you can operate equipment like this and not be aware that it will drift down when you turn the *engine* off.

Q You've got an assembly note highlighted in yellow in Exhibit 2. What is the reason for highlighting that?

Q Okay. That is a copy of a photograph of a decal on rhe rotary cutter. It indicates hov the rotary cutter should De attached to the three-point hitch, and it is nor--the rotary cutter is not attached *to* the three-point hitch a3 it's called for in that diagram.

Q And of what significance is that to this lawsuit, if any?

A If the rotary cutter were attached to the three-point hitch as called for in that decal, then the rotary cutter would not raise as high as it will in its present attachment, which would have made it more difficult or perhaps even impossible for Mr. Bennett to crawl under the *rotary* cutter.

Q At that point or anywhere? At that point where he crawled under or anywhere?

A Perhaps anywhere. I'm not sure. I have not taken---

Q Have *you* got an opinion as to whether or not he could have still crawled under it from the back?

A No, I don't. I have not relocated the rotary cutter.

Q Do *you* knor how nuch difference in ground clearance it would have made at the front, on the front right-hand side?

A I don't have a definite opinion. I would estimate that it would be perhaps two to three inches.

Q Which would mean that at the back it would have been maybe ten inches instead of thirteen inches?

A I can't say that because a three-point hitch attachment, if you change the attachment points, it

doesn't mean that the unit just moves straight down. may also change the angular orientation,

Q In fact, the back end could be higher, right,

Q 30 you couldn't rule it out without checking.

A No.

Q Okay. The next item is a caution label off the machine that you've got a copy of here, and you've highlighted in yellow that portion that says "Know All Operating Procedures and Safety Precautions in the Operator's Manual Before Operating the Tractor."

Of what significance is that to this lawsuit?

A That is a decal positioned directly in front of the operator, which he would have had--Mr. Bennett would have had an opportunity to see every time he was on the subject tractor, which would refer him, then, to the operator's manual for other precautions that he should take.

And if you then go to the operator's manual, it has a page of safety precautions, one of which indicates "Do not Leave equipment in the raised position," which had Mr. Bennett followed that safety precaution, this accident wouldn't have happened.

Q Does it say why?

A Well, it says at the top of this page of safety precautions that "The following precautions are suggested to help prevent accidents," and that most accidents can be avoided by observing certain precautions.

in that respect, it does tell him why he should do that, would be to prevent accidents. If you're asking me does it tell him that its will come down and catch him and what type of injury that he might sustain, then no, it does not do that.

Q And it doesn't suggest how you should perform the type of maintenance he was trying to perform, does it?

A No, it does not.

Q Isn't that an element of a good warning and safety instruction, would be to tell the operator how to do the necessary things that's foreseeable?

MR. KENNEY: I object on the grounds it calls for a legal conclusion,

THE WITNESS: Could you please repeat that?

MR. TOMLINSON: Not in a million years. How about getting this lady to read it?

(Whereupon, the reporter read the previous question.)

THE WITNESS: Would you rephrase that question?

MR. KENNEY: I'm not sure I understand it either.

BY MR. TOMLINSON:

Q If an item of maintenance *is* foreseeable, such as in this case, removing items *from* a rotary mower blade, would you agree *that*'s foreseeable?

A Foreseeable to who?

Q The manufacturer of the product.

A Which product?

Q The ti-actor.

A I'm not sure that is, because a tractor is made as a universal *piece* of equipment on which you can attach many different kinds of three-point hitch implements.

Q Isn't it foreseeable that a rotary mower will be attached to a Ford industrial tractor like this?

A Yes.

Q And Isn't it foreseeable that if that rotary mower is used in a normal manner that bailing wire cables or other items such as that might become entangled in the rotary blades?

A Yes.

Q Ani: wouldn't a good element of an operator's manual for the tractor, knowing that the maintenance such as that would be performed on attachments, whether they be manufactured by Ford *or* someone else, shouldn't that manufacturer tell how to perform maintenance under there?

MR. KENNEY: Are *you* asking him as a warnings expert, which he is not here tendered *as* such, *or* are

you just asking his opinion in general or---

MR. TOMLINSON: Whatever.

MR. KENNEY: I guess that's what he's saying is whatever. You can answer him, if you can.

THE WITNESS: It would he my opinion that if you are going to do maintenance on such a rotary cutter, that you should know how to do it, including how to block up the rotary cutter without being told.

BY MR. TOMLINSON:

Q Should Ford have a warning or instruction regarding that maintenance in its tractor operator's manual?

A No. i do not believe that would be necessary.

Q Should Ford warn of the consequences of *not* following Instruction 13 under Safety Precautions, which says quote: "Do riot leave equipment in a raised condition," end quote.

MR. KENNEY: Again, I have the same objection made earlier.

THE WITNESS: I would say that the preliminary statements on that precautions page indicates that If you don't follow these precautions, that an accident could happen.

I think that that should be sufficient for a person to realize what they should and shouldn't do.

BY MR. TOMLINSON:

Q The last page on Exhibit 2 is a lubrication chart where you highlighted the maintenance required to check the rear axle oil level. Can you tell me what the significance of that is to this lawsuit?

A Well, first of all, it indicates on that decal, which is also located under the right hood in the subject tractor, that you should check the rear axle lubricant level every 50 hours, and that that lubricant should be changed every 1200 hours; or--and/or.

The significance to this lawsuit is that there has been testimony that Mr. Bennett told someone during the lunch break--and my memory is that it wan Mr. Morgan, but I'm not totally sure of that--that his hydraulic oil was low, but he was continuing to operate the tractor.

I don't know if that has any significance to this lawsuit or not. I have not seen any indication in the described behavior of the three-point hitch that would indicate to me that the fluid was low.

I have a particular page there simply to indicate th instructions that were provided on checking that level, frequency of checking, and the frequency of replacing,

(Whereupon, Plaintiff's Exhibit 3 was marked.)

BY MR. TOMLINSON:

Q Please identify what's marked as Exhibit 3 to your deposition.

A Exhibit 3 to the deposition is a copy of the video tape made on March 14, 1988 during observation and measurement of the drift of the rotary cutter while attached to the three-point hitch on subject tractor.

Q Is that the same drift data that we find on the graph? I'm sorry--yes.

A Yes, it is the same data that is on the graph and also noted on one page of the notes.

(Whereupon, Plaintiff's Exhibit 4 was marked.)

BY MR. TOMLINSON:

Q Please identify Exhibit 4 to your deposition. We're going to be provider. with a copy of Plaintiff's Exhibit 3, is my understanding.

MR. KENNEY: Correct,

MR. TOMLINSON: Off the record.

(Whereupon, a discussion was held off the record.)

THE WITNESS: Exhibit 4 is an envelope containing a set of photographs and identification of those photographs, which were taken on March 15, 1988 during examination of the Ford tractor and Terrain King long reach rotary cutter, which is another unit owned by the City of Oklahoma City.

BY MR. TOMLINSON:

Q And those photographs are numbered what?

A These photographs are numbered 201 through 209.

MR. TOMLINSON: Okay, Do we have an agreement that we'll just attach a copy of the photographs with the numbers either written on the back or the front and the cover sheet, staple that together and call it Exhibit 4 to this deposition?

MR. KENNEY: Agreed.

MR. TOMLINSON: And either Dr. Appl can do that or you can let the court reporter.

MR. KENNEY: I was going to let the court reporter do it.

BY MR. TOMLINSON:

Q Are there any of these photographs that are of particular significance to your findings in this case?

A No, other than it just describes and depicts another: type of moving unit that Mr. Bennett operated,

Q How do you know he operated it?

A I was told that, by Mr. Kenney and Mr. Thomas.

Q Mr. who?

A Thomas.

(Whereupon, Plaintiff's Exhibit 5 was marked)

BY MR. TOMLINSON:

Q Please identify what's been marked as Exhibit 5 to your deposition?

A The envelope of Exhibit 5 consists of one photograph taken at the accident site and 30 photographs

taken of the subject tractor and rotary cutter, and a brief photograph identification for those photographs.

Q Are those photographs numbered?

A These photographs are numbered---

Q What numbers do they bear?

A The photographs taken of the subject tractor and rotary cutter are numbered 1 through 30, and the photograph of the accident scene is numbered 101.

Q How is it that you started with 200, then, on this Exhibit 4? Are you starting with a whole different series to keep them separate?

A YES, sir.

Q But these are all the photographs you've taken?

A Yes, sir.

MR. TOMLINSON: Okay. Do we have an agreement that Exhibit 5 will consist of Xerox copies of the photographs with the numbers either written on the back of the page or on the face of the photograph, along with the four gages of typewritten material that describe the photographs?

MR. KENNEY: Agreed.

BY MR. TOMLINSON:

Q Are any of these photographs of particular significance to your findings in this case?

A Well, that's a difficult question to answer. I

don't know all the questions that I would be asked. They generally depict the features of the subject tractor and of the rotary cutter.

And they show the position of the rotary cutter in the down position and in the up position. They also show the measurements at various points around the periphery of the rotary cutter while it is in the raised position.

Q Do you have an opinion as to whether there have been any modifications to this product--either of the products--their original sale that would have a significant impact on causing this accident?

A I am not aware at this moment of any modifications that have been made that I could say was a cause of +,-his accident.

Q How about---

MR. KENNEY: Let me be sure that we understand. You say modification. He's already told you about the reversing of the hookup that would change the height of the mower.

And I think he's assuming modification means some other change. But I don't want there to be any confusion.

BY MR. TOMLINSON:

Q Does that affect your answer?

A I would consider modification and alteration of either product to be something that was physically done

to alter or change that product. I did not include in that answer the mis-mounting of the rotary cutter to the tractor.

Q Okay. No modifications or alterations that you consider to be significant or contributing factors that caused the accident; is that correct?

A I'm not aware of any.

Q How about any improper maintenance that may have been a contributing factor to cause this accident, in your opinion at this time?

A The only thing that I would put in that category at this moment would be the attachment of the rotary cutter to the three-point hitch,---

Q Which you've already described.

A ---which I have already described for you.

Q Anything else?

A No.

Q Do you have a photograph that demonstrates what you consider to be the improper attachment?

(Whereupon, a brief recess was taken.)

BY MR. TOMLINSON:

Q Which photograph?

A I believe Photograph 17 illustrated the point.

Q And please explain to me how it's improperly attached.

A The three-point hitch lower links are attached

in the lower hole on the rotary cutter, whereas I believe they should be attached in the upper hole, and in fact, both the lower link and the stabilizer should be attached at the same point of the upper hole of the rotary cutter.

Q Is the stabilizer the upper bar in Photograph 17? Why don't you label the stabilizer with an "S"?

A All right. (Witness complies.)

MR. TOMLINSON: We need *to* take another break..

(Whereupon, a brief recess was taken,)

BY MR. TOMLINSON:

Q Okay. You've identified Photograph *i7* as the one that has the stabilizer hooked correctly and the lower left arm hooked incorrectly; is that right? And *you* put an "S" on the stabilizer?

A Yes.

Q Did *you* put an "A" on the arm, or "LA" for the lift arm?

A (Witness complies.)

Q Have you read the deposition of the Hesston-- the gentleman that represented the Hesston Corporation by deposition the other day?

A No, sir.

Q Tell me what you've done to investigate this matter.

A I have examined the subject tractor and rotary cutter and tested same. I have read the depositions. I

have read statements; examined video tape from apparently Mr. Hall, and photographs taken by Siebert and Bramsic.

A I've also read materials that apparently Mr. Eennett used in safety certification program. And I have read the police report, gone out and looked at the site of the accident, and studied the operator's manual for the tractor.

And I've also seen a manual for the rotary cutter. That's about all I recall right now.

Q Have you done anything in addition to that to prepare for the deposition?

A Not that I can recall.

MR. KENNEY: Did you look at the Terrain King setup?

THE WITNESS: I have--well, I've looked at another Oklahoma City rotary cutter unit.

BY MR. TOMLINSON:

Q Is that the one depicted in Exhibit 4?

A Yes.

Q These photographs here came from Mr. Bramsic?

A Yes, sir.

Q These came from Mr. Siebert?

A That's my understanding.

Q You got the personnel file of Mr. Bennett?

A Yes,

Q Please tell me of what significance any of the material in this file is to your investigation or conclusions in this matter?

A This file contains statements made by people that were at the site of the accident, which--most of which have now been deposed.

And it also contained reprimands that were given to Mr. Bennett during the course of his employment by the City of Oklahoma City, some of which indicated that he did not properly perform the preventative maintenance checks on, his equipment.

If the question of low hydraulic fluid *were* to arise, then these reprimands may become of more importance.

Q Well, they wouldn't determine whether or not the hydraulic fluid was low, would they?

A No. They wouldn't determine if it was low, but if it was low and he was out using the equipment, and he knew that it was low, then that would indicate that he was negligent in his duties to perform maintenance on his equipment and to do the preventative checks on the equipment.

Q But any prior reports of what he did or didn't would not determine whether or not it was low or whether *ox* not he ignored it being low, would they?

A They would not specifically determine the occasion of the accident, but they would indicate a tendency on his part to do that sort of thing.

Q Do you have any training in psychology?

A No, sir.

Q Are you holding yourself out to this jury to be an expert in human behavior when it comes to comparing past and future performance?

A Only what I've learned through living 50 years.

Q So you would be no more competent to determine whether or not his past behavior was repeated than any other 50-year-old; is that correct?

A Yes.

Q In fact, depending on your lifestyle, you might not be any more competent than somebody 25, if they had had more experience than you In human behavior, would you?

A That's certainly possible.

Q Is there anything else In that personnel record that is of significance to your: findings in this case?

A No, I don't believe so.

Q The statements of the witnesses you're talking about are the ones dated July 11th, 1984 and the subject is "Documentation, Accident of Jerry L. Bennett"?

A Yes, sir.

Q Looks like six statements.

A I don't recall counting them. If you say that's how many there are---

Q Well, you've got marked here Kenneth Winston, Ron Massey, Martin Lehman, L-E-H-M-A-N, David Paul McAfee, Janet Couch and Linda Kay Milner.

A Uh-huh, yes.

Q Okay. You've got a reprimand dated April 24, 1984; another one date March 13th, 1983; another one dated October 11th, 1983; another one dated April 13th, '82, and one dated April 20th, 1982; right?

A I believe that's correct.

Q And those are the only items which you have found to be significant in this personnel file?

A Yes.

Q And you've already explained their significance on the record in response to my questions?

A Yes, sir.

Q Okay. Next is an incident report. What significance do you find this?

A The only significance would be a reporting of an investigation that was done after or soon after the accident.

Q Anything particularly significant about the contents of that?

A No. I think I've already incorporated everything in here in what I've already told you.

a Okay. Give us the date of that and the author, the institctian that authored it.

A Well, it's from the Oklahoma City Police Department. It's a crime incident report dated 7-9-84. The author is J. L. Powell.

Q Okay. I'm going to hand you the Ford operator's manual. I don't know if it's the one for this machine at this time or what, but tell me what significance this item is.

A The significance of this operator's manual, which I? according to my information is *the* operator's manual that. would nave been supplied with the subject tractor, is that it presents safety precautions with indications that if those precautions are not followed, that an accident could occur.

And those safety precautions were such that had they been followed, this accident would not have occurred. And it also presents information concerning the function and operation of various features on the subject tractor, including the three-point hydraulic hitch.

Q Show me those instructions which if followed this accident would not have occurred.

A Had he not left the equipment in the raised

position, this accident would not have occurred.

Q You're referring to page 4, Item 13?

A Yes, sir.

Q Okay. What else?

A I'm sorry. I don't understand that question.

Q What other instructions are there in the Ford operator's manual that if followed would have prevented the accident?

A That is the one instruction that would have prevented this accident.

Q Are there any others--in the whole book I'm talking about.

A No, I don't believe so.

Q Pardon?

A I don't believe so.

Q Okay. Page 24, you've highlighted a portion in yellow. Of what significance is that?

A The portion highlighted deals with the position control lever and the function performed by the position control of the three-point hitch.

Q Page 26 and 27, you've highlighted certain portions. Of what significance are they?

A Again, they simply identify components of the three-point hitch and discusses their operation to some extent.

Q How does one know whether you need a stabilizer when using a *rotary* mower or not?

A I would say that if the rotary mower swung from side-to-side that you would need the stabilizer,

Q Does the use or non-use of the stabilizer have anything to do with this accident?

A No, sir.

Q Page 50, you've highlighted certain portions and page 51. What significance *are* they?

A Those portions deal with the hydraulic lift system and the portions highlighted deal with checking the oil level and changing the oil.

Q And how is that significant to your findings in this case?

A At the present time with the information I now have, I do not believe that it is significanc.

Q Next I'm going *to* hand you a document that has been marked TPC Training Systems. And back on page 70, it's got a portion that deals with blocking moving parts. Would you please explain the significance of this *to* your findings?

A It's my understanding that this document was a portion of the materials that had been supplied to Mr. Eennett. And I believe it was during his safety certification program.

And the particular page picked out deals with the blocking of moving parts, which indicates that you should never crawl under a suspended load unless it is firmly and securely braced and blocked, which would--well, further it indicates that if the machine you're working on does not have a support, make a temporary brace from a length of solid bar stock, pipe or wood, depending on how much weight or pressure the brace has to support.

This would indicate that Bennett had exposure to the idea that parts can fall and that he should take precautions before getting under suspended components.

Q Would you agree that that came out of Lesson 5, Plant Safety Machinery Safeguards?

I believe that's correct.

Q This material that we're dealing with here is not a plant--piece of plant equipment, is it?

A No, it is not. But the training or teaching would be the same.

Q Where did you get this?

A I was provided that by Mx. Kenney.

(Whereupon, Plaintiff's Exhibit 6 was marked.)

BY MR. TOMLINSON:

Q Can you identify what we have now marked as Plaintiff's Exhibit 6 to your deposition?

A What you have marked as Exhibit 6 is a portion

of the materials that I was supplied by Mr. Kenney and was informed that this was a portion of the materials used by Mr. Bennett in his safety certification program.

Q And specifically, it's Lesson 5 from that. It's the entire lesson that you'd highlighted that one page out of, isn't it?

A I have highlighted one page out of this entire group.

Q And what I've chosen to mark as Exhibit --

A It appears to be a page out of the specific portion entitled "Plant Safety."

Q Which is Lesson 5?

A Yes, sir.

Q Machinery Safeguards?

A Yes, sir.

Q And it's the entire Lesson 5 isn't it?

A I don't understand--oh, what you have given is Lesson 5.

Q Yes.

A I assume it will be if you clip it together.

Q Well, even though it's not clipped together right now, it constitutes all of Lesson 5. It's all of the material between Lesson 4 and 6, isn't it?

A I don't know. Yes, I would agree with that.

MR. TOMLINSON: I don't have any other questions.

MR. KENNEY: I have no questions.

MR. RENEAU: I have no questions.

THE WITNESS: I would like to read and sign.

Franklin J. Appl

STATE OF OKLAHOMA)
)
COUNTY OF OKLAHOMA)

Subscribed and sworn to before me this

_____ day of _____, 1988.

Notary Public

My Commission Expires:

CERTIFICATE

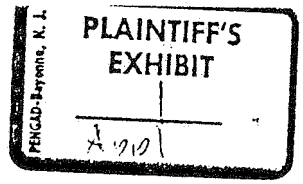
STATE OF OKLAHOMA)
) SS:
COUNTY OF OKLAHOMA)

I, Carol Marie McClure, Certified Shorthand Reporter and Notary Public within and for the State of Oklahoma, do hereby certify that the above-named FRANKLIN J. APPL was by me first duly sworn to testify the truth, the whole truth, and nothing but the truth, in the aforesaid case, and that the above and foregoing deposition was by me taken in shorthand and thereafter transcribed, and the same was taken on the 22th day of March, at 800 - One Leadership Square, at 3:00 p.m., in the City of Oklahoma City, County of Oklahoma, State of Oklahoma in pursuance of and under the stipulations hereinbefore set out and that I am not an attorney for the parties or a relative of either of said parties, or otherwise interested in the event of said action.

In Witness Whereof, I have hereunto set my hand and seal, this _____ day of _____, 1988.

Carol Marie McClure, Certified Shorthand Reporter and Notary Public for the State of Oklahoma

My Commission Expires:
May 17, 1988.



Depositions

Thomas

Winston

Lehman

Morgan

Narcisse

Stone

Blackman

Massey

McCormick

Abramczyk

Sevart

Kendrick

Bennett vs Ford Motor Company 5-14-88
Examination & testing of subject tractor and rotary cutter at the NE 4th plant in OKC

Subject Tractor: Ford Model 445
OKC Unit 7961538
Serial # C613197
Model KD341C Unit 9F05B
Engine 9E11B
Hyd. Pump 9D11A Hyd Lift 9A30A

Subject Rotary Cutter - Woods - 5 foot
Model B105, Serial 000312
OKC Unit 8286556

Rotary Cutter fully raised:

Bottom of runner to ground at front of left side	- 12"
Bottom of runner to ground at front of right side	- 10"
Bottom of runner to ground at rear of left side	- 15 3/4"
Bottom of runner to ground at rear of right side	- 13 1/2"
Bottom of skirt to ground at rear	- 19 1/4"

D1 = distance from bottom of runner to ground at rear of right side runner

D2 = distance from bottom of runner to ground at front of right side runner

Drift of rotary cutter with engine off

Time (min)	D1 (inches)	D2 (inches)	
0	13 1/2	10	
3	12 5/16	9 3/8	
6	11 1/4	8 5/8	
9	10	7 7/8	
12	8 5/8	7 5/16	
15	7 1/16	6 1/2	
18	5 3/4	5 3/4	
21	5 1/8	5 1/4	Rear wheel touching
24	4 1/4	4 5/8	
27	3 11/16	4 1/4	
30	3 5/16	4	

3-14-88

Subject Ford tractor and rotary cutter

Right test of 3 point hitch while A & Cappl jumped up and down on the deck of the rotary cutter and with engine off.

Distance from bottom of runner at the second bolt on the right side to the ground

time (min)	distance (inches)
0	11"
1	10 3/8
2	10
3	9 5/8
4	9 3/8
5	9 1/8
6	8 3/4
7	8 3/8
6	7 7/8
9	7 3/8
10	6 7/8

Bennett vs Ford Motor Company 3-14-88

Subject Ford tractor & rotary cutter
Video tape of test of drift of 3 point hitch with engine off

Distance from bottom of runner at second bolt on the right side to the ground

time (min)	distance (inches)
0	11"
1	10 5/8"
2	10 3/8"
3	10"
4	9 3/4"
5	9 1/2"
6	9 1/4"
7	9"
8	8 3/4"
9	8 1/2"
10	8 1/4"
11	7 3/4"
12	7 1/2"
13	7"
14	6 3/4"
15	6 1/4"
16	6"
17	5 1/2"
18	5 1/4"

Distance from Bottom of Runner at 2nd Bolt to Groove on Right Side of Riding Chair
(Time Minutes)
0
2
4
6
8
10
12
14
16
18
3-14-85

Bennett vs Ford Motor Company 3-15-88

Tractor with long reach rotary mower
Tractor - Ford 0632235
Model A254C
Unit 9M05B
Long Reach Rotary Cutter Terrain King

1st descent - 3 1/2" per min
2nd descent. Arm fully extended - Rear of rotary cutter to ground

Time (min)	Distance (inches)
0	40 3/4
1	37 1/2
2	37
3	36 3/4
4	36 1/2
5	36 1/4
6	36
7	35 5/8
8	35 3/8
9	35 1/8
10	34 7/8
11	34 5/8
12	34 1/2
13	34 1/4
14	33 7/8
15	33 5/8

Bennett vs Ford

Subject Tractor - June 5, 1979. final assembly date
- City of Okc City - Only owner
-

Ford Model 445 - Industrial Tractor
56-58 hp
3 cylinder

477

BENNETT V. HESSTON CORPORATION
DEPOSITION OF FRANKLIN J. APPL
March 28, 1988

5 - 20	Witness has opinion that accident was caused by victim's negligence in getting under a rotary mower on a three point hitch when he had been instructed not to do so unless the mower was blocked up.
6 - 2	He has opinion that mower drifted down slowly, not suddenly.
6 - 6	He has opinion that victim was under mower to remove a tangled cable or to take a nap.
7 -	Witness is concerned that victim did not realize the mower was drifting down over a relatively long period of time. Thus witness appears to consider sleeping as a possible reason.
7 - 21	He doesn't believe the victim could have been a rotary mower operator for a number of years and not have been aware that the three-point hitch would drift down.
9 - 22	Witness found that the lift would drop suddenly only if the lever was activated.
13 - 10	Based on measurements taken by witness on 3/14/88, the mower's right runner was 10" from ground in front and 13.5" from ground at the rear.
15 - 5	Witness agrees that if mower dropped 1" every 1.5 minutes then mower would have been on victim's chest in less than 1.5 minutes, ie assuming a 9" chest and a clearance of 10".
19 - 21	Witness noted that the rotary mower was not attached to the 3-point hitch as shown in the decal on the rotary mower.
20 - 3	If attached as shown on the decal the rotary mower would not raise up as high and it might not be possible for someone to crawl under it.
25 - 10	Witness recalls testimony that victim commented at lunch that his hydraulic oil was low but he was going to continue to operate the tractor.
30 - 25	He observes that the 3-point hitch lower links are in the lower hole of the rotary mower whereas he believes that they should be attached in the uppper hole and, in fact, both the lower link and stabilizer should be attached at the same point of the upper hole of the rotary mower.
35 -	There were 6 reprimands in the victim's personnel file regarding improperly performed preventive maintenance.

INDEX TO DEPOSITION OF

FRANK APPL

TAKEN MARCH 28, 1988

RE: Our File No. 5211-001

PAGE	LINE	
		PERSONAL INFORMATION
5	10	Name: Franklin J. Appl
		ACCIDENT
5	20-24	Opinion of cause: Negligence of Bennett in getting under rotary mower suspended on a hydraulic three-point hitch on tractor which was not blocked.
6	2-3	Further opinion of cause: Rotary cutter drifter down - No sudden drop.
10	23	Bennett negligence: Got under rotary mower held in raised position by three-point hitch while tractor was not running.
8	7-8	Bennett's knowledge: Not possible for Bennett to have been unaware of the way the rotary cutter drifts down.
6	2-12	Description: Bennett got under mower to remove tangled cable or take nap. Cutter drifted down over long period of time or someone activated lift control to lower cutter.
7	5-9	Reason for being under mower: Probably to disengage cable. Length of time causes concern.
7	21-25	Reason for concern: Not possible for Bennett to be rotary cutter operator for number of years and not know three-point hitch drifts down.

PAGE	LINE	
8	21-22	Explanation for Bennett not moving: When Bennett began *to* feel pressure of mower he was highly inattentive or asleep and did not respond by moving.
9	7-8	Mower movement: Based on depositions that state nobody was nearby, mower drifted down. Lift control probably was not activated.
9	22-23	Sudden drop of cutter: Mower lever activation is the only way that cutter could drop down suddenly.
11	11-20	Mower caught Bennett: On the right side with head closer to tractor than to rear of mower. Head, right shoulder, right arm and possibly right leg were under right side runner of rotary cutter.
		PRODUCT WARNINGS AND INSTRUCTIOMS
21	8-12	Tractor caution label: "Know All Operating Procedures and Safety Precautions in the Operator's Manual Before Operating Machine"
21	13-14	Significance of label: Positioned in front of machine operator and refers to operator's manual with precautions such as "Do Not Leave Equipment in the Raised Position".
22	1-10	Manual Explanation of Precautions: States that the precautions are suggested to help prevent accidents but does not explain that cutter will descend and catch the person beneath it.
23	11-13	Manual suggestions for method of similar maintenance: None.
24	10-12	Ford warning: Not necessary for Ford to warn or instruct maintenance procedures in the tractor operator manual.
36	12-22	Significance of Operator's Manual: Presents safety precautions that would prevent accidents, if followed. Also presents information on functions and operations of various features of the tractor.

PAGE	LINE	
38 39	22-25 1-8	~~Significance of TPE Training System~~: Supplied to Bennett during safety certification program. Indicates that you should never get beneath a suspended load unless it is firmly and securely braced and blocked.
		PRODUCTS
25	5-9	Tractor Decal: Under right hood, indicates that the rear axle lubricant level should be checked every 50 hours and changed every 1200 hours.
25	10-14	Significance: Bennett told Morgan during lunch break on the DOA that hydraulic oil was low, but was continuing to operate tractor.
30	6	Significant impact of tractor/cutter modification: Not aware of any modification that could have caused accident.
25	10-12	Significant impact of improper maintenance: Attachment of rotary cutter to three-point hitch.
38	5-7	Significance of use or non-use of stabilizer: None.
38	15-16	~~Significance of checking and changing~~ oil: None.
31 32	24-25 1-10	Investigative Procedures by Appl: Examining and testing of rotary cutter and tractor, read - depositions, statements, materials that Bennett used in safety certification program, police report and operator's manual on tractor and cutter; exam videotape from Mr. Hall and photos taken by Siebert & Bramsic; and visited accident site.

IN THE UNITED STATES DISTRICT COURT FOR THE

EASTERN DISTRICT OF OKLAHOMA

5

TED XLEMENTOVICH,

Plaintiff,

vs

ALLIED PRODUCTS CORPORATION, d/b/a BUSH HOG,

Defendant.

CASE NO. 88-576-C

* * * * *

DEPOSITION OF FRANKLIN J. APPL

TAKEN ON BEHALF OF THE PLAINTIFF

ON MAY 9, 1989

IN OKLAHOMA CITY, OKLAHOMA

* * * * *

APPEARANCES:

MESSRS. JOHN BAUM and TODD RALSTIN, Attorneys at Law, of the firm BAUM, RALSTIN & SHORES, 4808 Classen Boulevard,

REPORTED BY:

STEVE MEADOR, C.S.R.

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E X H I B I T I N D E X

Page

DOCUMENTS TO BE PRODUCED

Deposition of witness taken to be used in an action pending in the United States District Court for the Eastern District of the State of Oklahoma, wherein TED KLEMENTOVICH is Plaintiff, and ALLIED PRODUCTS CORPORATION, d/b/a BUSH HOG, is Defendant, said cause being Case No. 88-576-C in said Court, pursuant to the stipulations hereinafter set out.

- - - - -

STIPULATIONS

It is hereby stipulated and agreed by and between the parties hereto, through their respective attorneys, that the deposition of FRANKLIN J. APPL may be taken on behalf of the Plaintiff, on this, the 9th day of May, 1989, by Steve Meador, Certified Shorthand Reporter within and for the State of Oklahoma, taken pursuant to Agreement.

It is further stipulated and agreed by and between the parties hereto, through their respective attorneys, that all objections, except as to the form of the question and the responsiveness of the answer, are reserved until the time of trial, at which time they may be made with the same force and effect as if made at the time of the taking of the deposition.

And thereupon, the said Plaintiff produced the following witness, to-wit:

FRANKLIN J. APPL

having been first duly sworn, was examined and testified on his oath, as follows:

DIRECT EXAMINATION

BY MR. BAUM:

Q Please state your name for the record?

A Franklin J. Appl.

Q And what is your address, Dr. Appl?

A 1412 Sycamore, Norman, Oklahoma

Q Is that your residence?

A Yes.

Q And what is your business address?

A 3503 Charleston Road, Norman, Oklahoma.

Q And what is your occupation?

Engineering Company.

Q And how long have you had Appl Engineering Company?

A Since the first of 1978.

A Yes, I have it.

Q I have taken your deposition several times, several times before so I don't really want to go into all of your

credentials, Dr. Appl. Your business as Appl Engineering hasn't changed much in the last three or four years has it, I mean you haven't diversified much into anything else have you other than what you've been doing in the past?

A It's about the same as it has been.

Q All right.

MR. BAUM: Let's mark this exhibit as Plaintiff's 1.

Q (By Mr. Appl) Dr. Appl, you haven't taught have you at the university since what, '78?

A '81.

Q '81? Is that when you officially quit all your teaching duties?

A No. I officially resigned my full-time position in 1978 but I've been -- continued to teach one course a year until 1981.

Q And what course was that?

A Design Synthesis.

Q So presently since '81 you're not teaching at any university or college?

A That's correct.

Q And you're devoting all your time to Appl Engineering?

A Yes.

Q And the majority of your clients with Appl Engineering are attorneys, are they not?

A Yes.

Q And of the majority of them would it be fair to say about 95 percent are defendants or are you representing -- consulting for an attorney who's been retained by a company who's being sued?

A No.

Q What percentage would you say?

A I would estimate about 80 percent defendants, and 20 percent plaintiffs.

Q All right. Can you tell me some plaintiff cases you're working on right now?

A Newell versus Testers.

Q Neal?

A Newell.

Q Newell. What kind of case is that?

A It involves a hydrostatic test tube for oil well cubing.

Q All right. Who's the plaintiff's lawyer in that?

A David Edmonds.

Q All right. What other plaintiff cases?

A McBride versus Smith and Davis.

Q What kind of a case is that?

A That involves a walker, like an old person type walker.

Q What, what's allegedly wrong with the walker?

A It has a defective latching system.

Q All right. What other plaintiff cases you working on?

A Parker versus UNISYS.

Q And what is the alleged defects in that case?

A Well, I haven't gotten deeply into it but it probably will involve guarding or equipment location.

Q What kind of equipment is it?

A It's a swather.

Q Farm implement swather?

A Yes.

Q What, somebody get hurt using it?

A Yes.

Q It was from lack of guards?

A Well, like I say, I haven't gotten --

Q Approximately?

A -- deeply into it but that may be a part of the case.

Q Have you given your deposition yet?

A Oh, no.

Q Who's the plaintiff's attorney?

A David Edmonds.

Q All right. What other cases?

A I have another one that somebody versus General Motors that I can't remember the plaintiff's name.

Q And it's my case, Anderson versus General Motors?

A Pardon?

Q Anderson?

A No.

Q Okay. Are these all the plaintiff cases you have going right now?

A I suspect there are some more but -- oh, Green versus Gibson's.

Q What's the product there?

A A scooter board.

Q Scooter board?

A Uh-huh.

Q Any others?

A Mills versus Joe Logan.

Q What's the product?

A Bale hook.

Q Bale hook?

A Bale, B-A-L-E, hook.

Q Does it involve guarding at all?

A No.

Q what other ones?

A That's all I recall.

Q That's all you can think of? Have you testified for plaintiffs in any guarding cases in the past?

A I don't recall.

Q when were you contacted on this case?

A In January of 1989.

Q Who contacted you?

A I was initially contacted by Mike Nol nd.

Q That's the firm of Niemeyer, Noland, Alexander?

A Yes, sir.

Q You worked for them many times in the past have you not?

MR. VERNON: Object to the form of the question.

THE WITNESS: I've worked for them a number of times

Q (By Mr. Baum) Ten times or more?

A For, for the particular makeup of the firm --

Q Well, let's count all the time --

A -- it would be a number of times, I don't know the number of time.

Q Let's count all the times when they were Foliart and Niemeyer?

A Yes. There have been some changes over the years.

Q Including both of those firms, maybe 20, 30 times?

A If you lump them altogether it's quite a number of times.

Q And what was your first introduction in this case, what did they give you?

A Well, Mr. Noland just called me up on the telephone and briefly told me about the case.

Q All right.

A Eventually I received some depositions and a video tape.

Q Which video tape?

A It's -- it was some video tape of -- prepared by Mr Sevart.

Q All right. Were they of the guard and the dummies?

A No, the one that I received I don't recall any guards and dummies on it. It was just cutting through a field with a guard on it. My recollection of that first tape that I received.

Q All right. What else did you receive?

A Oh, I received a copy of the ASAE paper by Mr. Sevart.

Q Is that the one that's presented to the American Society of Agricultural Engineers?

A Yes. Well, I thought that may be about all that I received.

Q Up to this point?

A Yes.

Q Have you received the film the Bush Hog did of the mowing test and the dummies and the guard?

A I have a video tape that, that -- of tests that I conducted at Bush Hog.

Q At Bush Hog?

A Yes.

Q You went down there?

A Yes.

Q Down to Selma?

A Yes.

Q How much time did you spend down there at Selma?

A Oh, let's see, three and a half days.

Q All right. Did you do -- that's where you did your testing?

A Yes.

Q Did they show you anything where they'd done testing in the past?

A No.

Q You've never seen that film?

A No.

Q Well, they have a film where they did some testing back in '83, that's what I'm referring to. You haven't seen it?

A No.

Q You might remember it because they, they started cheering, finally hit the dummy and they started screaming?

A I haven't seen it.

Q You would remember that.

A Pardon?

Q I figured you'd remember it, you could hear the hollering when they hit the dummy.

A I --

MR. VERNON: Is that a question?

THE WITNESS: -- recall what I've seen and I have not seen that on tape.

Q (By Mr. Baum) All right. When did you go down to Selma to do your testing?

A It was at the end of April.

Q So just this last April?

A Yes.

Q All right. So you read the depositions you were sent, which I presume was Mr. Klementovich the plaintiff, right?

Yes, sir.

Q Read his grandson's deposition?

A Yes, sir.

Q Did you read Mrs. Klementovich's deposition?

A Yes, sir.

Q And you read Mr. Sevart's deposition?

A Yes, sir.

Q Did you read the depositions of the people from Bush Hog, Mr. Buster?

A No. I have not seen that.

Q All right. So you read those. Did you -- and the papers that were sent in Mr. Sevart's depositions, and then you went to Selma, is that proper chronology of everything you've done?

A Well, actually the chronology is not correct, I had read some depositions before I went to Selma and some depositions after I returned.

Q All right. Which ones did you read after you returned?

A I believe I actually read most of Sevart's after I returned.

Q After you had done your testing, right?

A Yes.

Q All right. Did you make a report up on this testing?

A I did not make a report. I have my notes.

Q Okay. Would you -- did you bring those with you today?

A Yes.

Q May I see those? Where did get your guard?

A It was at Bush Hog in Selma.

Q Who made the guard?

A I don't know.

Q Did you compare it with Mr. Sevart's?

A I've never seen Mr. Sevart's guard except in photographs.

Q Did you ever see any drawings of Mr. Sevart's guard?

A Only those in his paper.

Q All right. Was this guard the same guard or was it different?

A It appears to be the same.

Q All right. Do you have photographs of your guard?

A Yes.

Q Where are they? Is this guard in picture Number 16?

A Pardon?

Q You got it marked 16 on the back?

A Yes.

Q Is this the guard?

A Yes.

Q You think that looks like Mr. Sevart's guard?

A Yes.

Q You think that looks like the same guard?

A Well, that guard that you're showing me something labeled figure 1 has a -- looks like some kind of a contour to it that fit the front of the cutter. Figure 2 looks like, very much like the guard that was used.

Q You think it's the same design?

A It appears to me to be.

Q All right. I understand you video filmed this guard too --

A Yes, sir.

Q -- in your test; is that correct?

A Yes, sir.

Q Who did the video filming?

A A video person from Selma by the name of Larry Moore.

Q All right. He lives in Selma?

A Yes.

Q And on your data sheets here and your netes, when you got zero what do you mean?

A I mean the guard is placed at ground level.

Q All the way on the ground?

A Down to the ground.

Q And you're traveling at what speed?

A Two miles an hour.

Q All right. You got here a zero, says no limb under ieck. And you get down here and you got a zero, you say both .egs and one arm under deck. Zero you say both legs under leck. How do you account for that, in other words?

A How how do I account for that?

Q Yes.

A I account for that by indicating that out of, one out f 16 tests the guard prevented any extremity of the dummy rom going under the deck of the mower. In all of other 15

tests at least one extremity or limb of the dummy went under the deck of the mower.

Q Well, why didn't it do it on the other one?

A I don't understand the question.

Q Were you on the same terrain, were you on the same ground level?

A Sure.

Q Doing it in the same area?

A Yes.

Q How long is your film?

A I would guess it's close to an hour.

Q So in all your testing you came up one time it didn't grab it, one out of 16?

A Yes.

Q And you tried it 16 times; is that correct?

A Yes.

Q Was the setting on high or low?

A I don't understand that question.

Q Well, the Bush Hog elevates, was it a high setting, a low setting or what?

A On the first 13 tests the skid of the Bush Hog was even with the guard and the position of the skid relative to the guard for the last three tests is as indicated in my notes.

MR. BAUM: Why don't we take about a ten-minute break

Q (By Mr. Baum) Dr. Appl, this is the Bush Hog done in 1983 at the Bush Hog plant? Now, that's considerably different than yours, isn't it, look at the distance there is between the guard and the back wheel is considerably different, isn't it, Doctor?

A Would you ask that question again.

Q Well, from your tape we viewed it while you were out of the room and we'll put it back on in a minute, but on this one, the distance between the guard and the back wheel is much longer than it is on your model; isn't that correct?

A It appears that way. Can you back it up so I can see it again.

Q What's the difference between a pull type mower and the one you've got?

A A pull type mower hitches to the draw bar of the

tractor and has a tongue going back to the mower whereas a three point hitch mower attaches directly to the three point hitch of the tractor and is therefore much closer coupled than a pull type mower.

Q So would you say there's about three feet difference there? Three or four?

MR. VERNON: From where to where?

MR. BAUM: From the back wheel to the guard.

THE WITNESS: I don't have a good frame of reference but I'll agree there is a considerable distance with this pull type mower from the back wheel to the guard.

Q (By Mr. Baum) All right. In yours there's very little, there's only maybe three or four inches is there --

MR. VERNON: Object to --

Q (By Mr. Baum) -- if there's that much.

MR. VERNON: Object to yours.

Q (By Mr. Baum) On the one you did your testing on?

A Oh, I think maybe a foot or so. Eight inches, a foot.

Q You think that's eight inches or do you think that's a foot in there?

A I don't have a good reference on this. It's close there's no question about it.

Q A foot or less, right?

A I'll agree with that.

Q All right. And then on your testing, Doctor, the back wheel would go -- you had the back wheel going over the dummy; is that correct?

A In some of the tests, yes. Well, I guess in all of the tests.

Q In all the tests; isn't that correct?

A Right.

Q And you're going to have to admit, Doctor, when the back wheel goes over the dummy the Bush Hog raises up doesn't it?

A Well, that's the nature of a three point hitch implement, it follows what the tractors does.

Q The Bush Hog raises up does it not?

A Yes.

Q And when it raises up the guard raises up doesn't it?

A Yes.

Q And then the Bush Hog comes down on the dummy?

A Pardon?

Q And then the Bush Hog comes down on the dummy because it raised up when the wheel went over it?

A Yes.

Q All right. And that's the way it was on all your tests that you conducted, isn't it?

A All the tests are conducted with a tractor with three point hitch and three point hitch mower and it follows

exactly.

Q Well, you would agree with me it would be a totally different test if you had more distance between that back wheel and the guard because it wouldn't bounce it up, it would have time to come down wouldn't it?

A I agree it would be a different test because it would be a different piece of equipment.

Q It would be a different test too, wouldn't it?

A It would be a different piece of equipment, same test.

Q And you would have different results wouldn't you, Dr. Appl?

A I don't know.

Q Well, if the guard came down flat and then hit, pushed up against the dummy that's less likely to go underneath it, isn't it?

A It would -- on the surface it would appear so but since I haven't conduct those tests I cannot offer any opinion in that area.

Q Well, you'd have to agree that it would be less likely wouldn't it?

A I think I've already said that.

Q Can't those barnacles drawn to be adjusted outward and give more distance back of the tractor wheel?

A **No.**

Q You're sure?

A Yes.

Q No reason they couldn't be lengthened out in design is there?

A I guess you'd have to talk to the tractor maker about that.

Q Well, what puts the distance there is the distance o the arm made by Bush Hog, isn't it?

A No.

Q Well, they make the extension that hooks onto the Hog's part right here, see, what do you call that, power take off hook up?

A The shaft?

Q Yes, the shaft.

A It's a P.T.O. drive shaft.

Q Yes. That's made by Bush Hog, isn't it?

A Yes.

Q All right. And if they made it longer it would extent the difference between the wheel and the guard would it not?

A No.

Q It **would not?**

A No.

Q Now, explain to me why it wouldn't?

A Because the Bush Hog itself is attached to the three point hitch of the tractor. The drive shaft is not the thing that provides the attachment to the tractor for holding and carrying. All the drive shaft does is provide the conduit for power transmission from the tractor to the gear box of the Bush Hog.

Q Well, Bush Hog can design it where it would extend back further couldn't they by an attachment?

A Possibly. Of course you would then defeated the purpose of the three point hitch and probably defeated the action of the three point hitch.

Q Well, if it were extended back, Doctor, one way or the other either by Bush Hog or some other way then the wheel wouldn't bounce and the guard wouldn't be off the ground would it because it would have time to go back down after the wheel went over any object such as a dummy?

A Possibly.

Q And quite possibly the dummy wouldn't get under the guard that way would it?

A I don't know. I have not done any tests 'like that so I --

Q Well, it sounds logical though doesn't it?

A Well, I don't know.

Q Isn't that pretty much common sence that once it's down on the ground it's less likely instead *of* being bounced up in the air from the wheel action?

A I'm not going to comment about things that I have not tested.

Q Well, you don't have an opinion on that do you?

A No.

Q Do you plan on doing any testing on that?

A No.

Q No? So when it comes time to go to Court you wouldn't have any opinion because you wouldn't have done anything on it; is that right?

A That's correct. Unless I see something different, well, I'm --

Q well, is that -- whoever has tested it, you're going to have to go along with them on that aren't you? If you're not going to do anything you don't have any opinion; is that correct?

A That doesn't mean I'm going to degree with anybody else either.

Q But you have no opinion?

A That's what I said.

Q If you've got an opinion I want to hear it today, you going to have an opinion on that or not?

A **I've** already told you.

Q You have no opinion?

A That's right.

Q And so I take it you cannot render an opinion at the time of trial either, Doctor?

A No.

Q That's for the record and for the Court?

A If I'm provided additional information I'll look at it. If that changes my opinion I'll let you know.

Q Well, if extending it back would prevent the dummy from going under there that would be a very desirable thing to have on this wouldn't it, a guard like this?

A Well, if the guard worked.

Q It would be very desirable wouldn't it?

A If the guard kept the utility of the product then yes, a guard would be a good thing to have on there.

Q And save a lot of lives wouldn't it.

MR. VERNON: Object to a lot of lives.

THE WITNESS: Some.

Q (By Mr. Baum) Well, have you done any research as to statistics on the deaths annually from this type of thing, a Bush Hog whether it's a -- made by Allied Products or someone else?

A I have not done any formal research.

Q All right. This -- where is that. exhibit, the last last one I used -- let's see, Dr. Appl, is Exhibit Number 20

of -- let's see, what was his name, Dr. Nelson's deposition. And it is Second Annual US Farm Accident Report, 1987, by Arnold B. Skromme, PE. Dr. Nelson was aware of this individual. And in this report he shows in 1987 25 dead from a Bush Hog or mowers. My question is, with those kind of statistics, Doctor, it would be extremely desirable if that guard were to work wouldn't it, to have it on this product?

A I would agree if you had a guard that did work and preserved the utility of the product it would be desirable to have a guard on it.

Q Was your guard adjustable that you had down at Selma?

A Yes.

Q How did you adjust it?

A It was manually adjustable, moved it up and down relative to the skid of the mower.

Q Did you have to adjust it each time? Have bolts?

A Yes.

Q So you put it on different settings, put the bolt on that setting?

A Yes.

Q Is that the way Mr. Sevart's guard was in his paper?

A Well, it is in at least one of his papers.

Q All right. How many papers have you seen?

A I think he's got two.

Q All right. Now in regard to the utility of this,

have you tested for the utility on it?

A Yes.

Q And what all did you test, I notice -- is this your data right here?

A Yes.

Q Where is says field tests?

A Yes.

Q Well, this wasn't with dummies was it?

A No.

Q You took it into a pecan grove?

A Yes.

Q Were you driving the tractor?

A No.

Q Who was, a Bush Hog employee?

A Yes.

Q Do you know his name?

A Yes, if you'll give me my notes.

Q Okay.

A It's Mark Verhoff, V-E-R-H-0-F-F.

Q All right. May I have that back. Are these your photographs that show your field tests here, part of them?

A Yes, sir.

Q I notice this -- was this path here to start with, like this is your picture Number 103, was this path like this?

A No.

Q You cut that path?
A Yes.
Q So you had to cut all this down?
A Yes.
Q Did you try cutting all that down without the guard on it?
A Yes.
Q Well, what happened without the guard on it?
A Went through just slick as a wink.
Q Okay. You admit this is awful high stuff there, isn't it?
MR. VERNON: Object to awful high stuff.
Q (By Mr. Baum) Isn't it? How many feet tall is this?
A Some of that stuff is probably six or eight feet

Q All right. There are big thick twigs and then stems on them and they're pretty thick and toug?
A I believe that the stems were about an inch and a quarter is about the largest I saw in the way of stems.
MR. BAUM: Let's mark this whatever we're up to Number 2 now?
Q (By Mr. Baum) Did you film this, this *is* Plaintiff's Exhibit Number 2, we introduce at this time. Does this -- did you film this cutting?
A Yes.

Q Did you film it with the guard and without the guard‘

A Yes.

Q Do you have those films with you?

A They’re on that video.

Q On that same video?

MR. BAUM: You‘ll get me one supplied with that right away won’t you?

MR. VERNON: Yes.

Q (By Mr. Baum) Is this about the tallest, thickest thing you cut?

A I‘d say so, yes.

Q How about the spring growth and pecan grove, was it as tall as this?

A No, that was grass and weeds and --

Q Doctor, you said you cut, you cut this without a guard too?

A Yes.

Q All right. I just don’t see that here in your field ests.

A Number E, no guard, skid two inches above ground. ild plum bushes in pecan grove.

Q All right. Number E, I didn’t see it there. How igh were the bushes in Number E?

A Six to eight feet.

Q What‘s the recommended position of the mower to

obtain the best cutting results, do you know what recommendation?

A I don't know. I would say between ground level and the skid, two inches above the ground would be desirable level. But I don't know what the recommendation might be.

Q well, the manual says here that machine should always be run at the highest position which would give the desired cutting results. The highest position will prevent the blades from cutting into the ground, will reduce wear, undue strain on the whole machine. That's what the manual says. Now, two inches is not the highest level is it?

A It is if that's where you want your cut made.

Q Well, that's not the highest level?

A Well, I am sure you could raise this up two feet if that's what you wanted to do.

Q Well, that's what the recommendation --

A That wouldn't be a desirable cut level.

Q But that's what they recommend for the best results, isn't it?

A I wouldn't say so.

2 Pardon?

A I wouldn't say so.

Q Well, that's what Bush Hog says; isn't that right?

MR. VERNON: Object. Mischaracterizes what the nanual says.

THE WITNESS: I believe what it says, is the machine should always be run at the highest position which would give the desired cutting results. If you want to cut close to the ground you run the mower close to the ground.

Q (By Mr. Baum) Now, in regard to these plum bushes here, do these bushes grow plums?

A Yes.

Q Well, why would you want to get a Bush Hog in there and cut down nice plum bushes?

A Because they're a nuisance.

Q You mean something that grows wonderful things like plums to eat is a nuisance?

A They're very similar in appearance to the sand hill plums that grow around here, which are considered a nuisance.

Q I wonder why -- was this on a farm, ssmebody's farm and complaining of these plum bushes?

A No. I believe they were wild plum bushes.

Q All plum bushes?

A Yes.

Q Are you sure?

A They weren't planted.

Q All right. Whose property was this?

A I don't know.

Q You don't know?

A No.

Q Would you consider this to be an ordinary use of this machine cutting down nice plum bushes six to eight feet high?

MR. VERNON: Object to nice plum bushes, what does that mean?

Q (By Mr. Baum) Well, when he said --

A I would consider it to be an ordinary use of the machine.

Q Did you taste any of those plums?

A No.

Q So you really don't know what kind of plums they were zither?

A Well, when I was there they were green plums.

Q They were green plums?

A Which I did not desire to taste.

Q You like -- whose idea was it to get rid of the plums, the eight feet high plum bushes?

A I would say I was a part of that decision.

Q All right. Did the tractor operator get tangled in 11 that, those plum bushes eight feet high he had to go hrough, barrel through?

A No, he seemed to make it through.

Q Did he have a seat belt on?

A Yes.

Q What if he hadn't had the seat belt on, do you think hose eight feet high plum bushes would have knocked him off

there?

A No.

Q You don't. And what would happen if he had gotten knocked off?

A Well, if he had gotten knocked off I imagine we might possibly have had an accident.

Q Might have got his legs chopped off, right?

A If he went under the cutter, that would be a possibility.

Q We have the film, we have all *of* these photographs which George is going to provide me a copy of. You got your daily sheet, what else did you bring with ycu?

A Well, --

Q These are just your deposition outlines?

A Yes.

(Whereupon, a short break was had.)

Q (By Mr. Baum) Dr. Appl, can you tell what these Polaroid pictures, what they're of?

A These are three Polaroid pictures sent to me by Mr. Vernon, and I believe that they are the guard which I then tested, but they are in these photographs attached to some different mower.

Q To the -- substantially the same type mower?

A It appears to be the -- substantially the same. But it's not the same ones as used in the test.

Q Okay. This is all Sevart's stuff, is it?

A Sevart's exhibits and then the four depositions.

Q That's everything you've got?

A That's my entire file.

Q Dr. Appl, would you agree with me that if this guard would work and it would not destroy the function of the product and if one was -- if it would work and it would not destroy the function, and it wasn't placed on a product, that that product would be unreasonably dangerous and defective wouldn't it?

A Well, that would have to be determined, but I'm in agreeance that if a guard could be made that would not destroy the function of the product and would provide protection of people that it ought to be used.

Q Have you ever testified in a Bush Hog case before using that as a generic name?

MR. VERNON: A rotary cutter case you mean?

MR. BAUM: Right.

Q (By Mr. Baum) Or rotary mower case?

A I have worked on I believe two other rotary mower cases.

Q And what companies were they for?

A They were for a company called Mono.

Q All right. And were you testifying for the defense or the plaintiff?

A Defense.

Q And who was the attorney that retained you?

A I believe both of those were for Earl Mills.

Q All right. How long ago was that, Dr. Appl?

A That's been quite a number of years, I'm going to say seven or eight years ago. Or more.

Q Do *you* know who the plaintiff's attorney was?

A No, I don't remember.

Q So two cases involving a Mono mower, any for Allied Products before?

A Rotary cutters?

Q Yes.

A No.

Q For other Allied products?

A I believe I have worked on two cotton gin cases for a ranch of Allied.

Q So they have retained you before for other products?

A Yes.

Q Did you ever in any of these tests you ran, not run over the dummy first?

A Pardon?

Q Not run over it first?

A No.

Q Always with the back wheel or front the 1 and back wheel?

A Yes.

Q Did the guard ever break off?

A No.

Q Always stayed on?

A Yes.

Q What is this picture here?

A What is it?

Q Looks like the guard's loose there, they're all laying on the ground?

A We had to unbolt it to get the tractor unstuck.

Q Looks like you had it set so low that it was chopping up the dirt and digging into the ground?

A Let me see that one. This was a test with the guard set at ground level. And that is how the guard behaves at ground level, scrapes up, collects all the materials, the dirt and finally just sticks the tractor.

Q Did you have the mower at its lowest possible setting?

A No.

Q All right. What did you have it on?

A We had the guards set even with the ground.

Q What did you have the mower set at?

A Well, the skid was approximately even with the ground.

Q The skid, what do you mean by skid?

A The bottom of the runner of the mower at the front.

Q This part here?

A Right.

Q So you had it dragging on the ground too?

A Yes, we had it down even with the ground.

Q Couldn't you have the guard down with the mower up, the skids up?

A Pardon?

Q You could have the guard all the way down with the skids up couldn't you?

A You could have the guard down and have the mower positioned higher, yes.

Q Did you ever do that?

A No.

Q Never did that in any of your testing?

A Mot in the field, we did with some dummies.

Q Do you think that would make a difference in the way it clogged up?

A No.

Q Why?

A Because the guard is what was clogging up not the lower.

Q But you didn't test it to see did you?

A Not necessarily.

MR. BAUM: That's all I have.

MR. VERNON: We don't have anything, And we don't waive signature.

MR. BAUM: We want to introduce these Polaroid photographs and introduce them.

I, FRANKLIN J. APPL, do hereby state under oath that I have read the above and foregoing deposition in its entirety and that the same is a full, true and correct transcript of my testimony.

_____
FRANKLIN J. APPL

SUBSCRIBED AND SWORN TO BEFORE ME on this, the _____ day of _____, 1989.

_____
Notary Public,
State of _____

My Commission Expires:

_____

CERTIFICATE

STATE OF OKLAHOMA)
) SS:
OKLAHOMA COUNTY)

I, Steve Meador, Certified Shorthand Reporter, do hereby certify that the above-named FRANKLIN J. APPL was by me first duly sworn to testify to the truth, the whole truth and nothing but the truth in the case aforesaid; that the above and foregoing deposition was taken in shorthand and thereafter transcribed; that the same is true and correct; that the same was taken on the 9th day of May, 1989, in the City of Oklahoma City, County of Oklahoma and State of Oklahoma, by Agreement and under the stipulations hereinbefore set out, and that I am not attorney for or relative of any of said parties, or otherwise interested in the event of said action.

IN WITNESS WHEREOF, I have hereunto sot my hand this 18th day of May, 1989.

STEVE MEADOR, C.S.R.,
within and for the
State of Oklahoma, No. 294

Franklin J. Appl

President, Appl Engineering Company, Norman, Oklahoma.
Adjunct Professor, School of Aerospace, Mechanical and Nuclear Engineering, University of Oklahoma.

Education:

B.S., Mechanical Engineering, Kansas State University, 1960.
M.S., Mechanical Engineering, University of Illinois, 1962.
Ph.D., Theoretical and Applied Mechanics, University of Illinois, 1964.

Professional Experience:

Ford Foundation Teaching Intern Fellow, University of Illinois, 1960–1962.
Assistant, Theoretical and Applied Mechanics, University of Illinois, 1962–1963.
Instructor, Theoretical and Applied Mechanics, University of Illinois, 1963–1964.
Assistant Professor, School of Aerospace and Mechanical Engineering, University of Oklahoma, 1964–1969.
Resident in Engineering Practice, Applied Mechanics Division, Caterpillar Tractor Company, 1966–1967.
Associate Professor, School of Aerospace, Mechanical and Nuclear Engineering, University of Oklahoma, 1969–1973.
Assistant Director, School of Aerospace, Mechanical and Nuclear Engineering, University of Oklahoma, 1971–1978.
Professor, School of Aerospace, Mechanical and Nuclear Engineering, University of Oklahoma, 1973–1978.
Adjunct Professor, School of Aerospace, Mechanical and Nuclear Engineering, University of Oklahoma, 1978–present.
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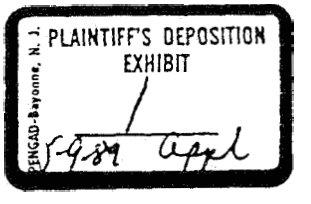
Professional Affiliations:

American Society of Mechanical Engineers
Society of Automotive Engineers
Society for Experimental Mechanics
American Society for Engineering Education
American Academy of Mechanics
Oklahoma Academy of Science
American Society for Nondestructive Testing
American Society for Testing and Materials



Franklin J. Appl

Professional Honors:

Tau Beta Pi
Sigma Tau
Pi Tau Sigma
Sigma Xi
Who's Who in the South and Southwest
Who's Who in Oklahoma
Who's Who in the Computer Education and Research
Ralph R. Teetor Award, Society of Automotive Engineers, 1968.
Outstanding Teacher Award, University of Oklahoma Chapter of Pi Tau Sigma, 1969, 1975.
American Men & Women of Science

Professional Publications:

"Application of the Enclosure Theorem to the Determination of Buckling Loads of Tapered Columns which are Time Independently Inelastic or Which Creep", by F.J. Appl, Ph.D. dissertation, University of Illinois, (1964).

"Two-Dimensional Couple-Stress Elasticity with Application to Two Examples involving Concentrated Loading", by C.W. Bert and F.J. Appl, presented at the Fifth United States National Congress of Applied Mechanics, Minneapolis, Minn., (June 1966).

"A Numerical Method of Analysis of Plane Elasticity Problems", by F.J. Appl and D.R. Koerner, Research Department Report 16509-1, Caterpillar Tractor Company, Peoria, Illinois, (June 1967).

"Approximate Solutions of Some Plane Elasticity Problems", by F.J. Appl and D.R. Koerner, Research Department Report 16509-2, Caterpillar Tractor Company, Peoria, Illinois (October 1967).

"Buckling of Inelastic, Tapered, Pin-Ended Columns", by F.J. Appl and J.O. Smith, Journal of the Engineering Mechanics Division, Proceedings of ASCE, Vol. 94, No. EM2, pp. 549-558 (April 1968).

"General Solution for Two-Dimensional Couple-Stress Elasticity", by C.W. Bert and F.J. Appl, ATAA Journal, Vol. 6, pp. 968-969, (May 1968); errata, Vol. 7, p. *384* (Feb. 1969).

"An Engineering Approach to Fatigue Strength Analysis", by F.J. Appl, presented at the SAE Mid-Year Meeting, Detroit, Michigan (May 1968).

"Numerical Analysis of Plane Elasticity Problems", by F.J. Appl and D.R. Koerner, Journal of the Engineering Mechanics Division, Proceedings ASCE, Vol. 94, No. EM3, pp. 743-752 (June 1968).

"Low-Cycle Fatigue of a Glass-Fabric-Reinforced Plastic Laminate". by T.K. James, F.J. Appl, and C.W. Bert, Experimental Mechanics, Vol. 8, No. 7, pp. 327-330 (July 1968).

Fatigue Design Handbook, James A. Graham, Editor; John F. Millan and Franklin J. Appl, Assistant Editors; SAE Publications *AE-4*, New York (1968).

"Stress Concentration Factors for U-Shaped, Hyperbolic, and Rounded V-Shaped Notches", by F.J. Appl and D.R. Koerner, ASME Paper No. 69-DE-2, presented at the ASNE Design Engr. Conf., New York (May 1969).

"An Investigation of the Hole-Drilling Technique for Measuring Planar Residual Stress in Rectangularly Orthotropic Materials", by B.R. Lake, F.J. Appl, and C.W. Bert, Experimental Mechanics, Vol. 10, No. 6, pp. 233-239 (June 1970).

"Stress Concentration in Tensile Strips with Large Circular Holes", by R.G. Belie and F.J. Appl, Experimental Mechanics, Vol 12, No. 2, pp. 190-195 (April 1972): Discussion, Vol. 13, No. 6, pp. 255-256 (June 1973).

"Improved Bounds For Buckling Loads of Tapered Inelastic Columns", by D.M. Sheets and F.J. Appl, Journal of Applied Mechanics, Vol. 39, No. 2, Trans. ASME, Vol. 94, Series E, pp. 621-623 (June 1972).

"Point Loaded Disks and Blocks Applicable to Tensile Testing of Brittle Materials", by F.J. Appl, Journal of Strain Analysis, Vol. 7, No. 3, pp. 178-185 (July 1972).

"Acoustic Emmision for Monitoring Fatigue Crack Growth", by D.M. Egle, J.R. Mitchell, K.H. Bergey, and F.J. Appl, presented at the 27th Annual Conference of the Instrument Society of American, New York, New York (October 1972); Advances in Instrumentation, Vol. 27, pp. 1-7 (Oct. 1972); Instrument Soc. of America Trans., Vol. 12, No. 4, pp. 368-374, (Dec. 1973).

"Lateral Rigidity of Longitudinally Stiffened Plates", by W.L. Craver, Jr. and F.J. Appl, Journal of Applied Mechanics, Vol. 39, No. 4, Trans. ASME, Vol. 94, Series E, pp. 1158-1159 (December 1972).

"Effect of Rivet Spacing on Crippling Loads of Joined Aluminum Angles", by F.J. Appl and M.B. Whelton, The Aeronautical Journal, Vol. 77, No. 750, pp. 302-304 (June 1973).

Franklin J. Appl

"Detecting Fatigue Cracks Using Acoustic Emission", by J.R. Mitchell, D.M. Egle, and F.J. Appl, presented at the 61st Annual Meeting of the Oklahoma Academy of Science, Weatherford, Oklahoma (November 1972); Proceedings of the Oklahoma Academy of Science, Vol. 53, pp. 121-126 (1973).

"Lingual-Palatal Pressure Measurement and Analysis", by F.J. Appl and H.A. Leeper, Jr., presented at the ASME Winter Annual Meeting, Detroit, Mich. (Nov. 1973); ASME Paper No. 73-WA/Bio-28 (Nov. 1973).

"A Numerical Method for Heat Conduction Problems", by M.J. Reiser and F.J. Appl, Journal of Heat Transfer, Trans. ASME, Series C, Vol. 96, No. 3, pp. 307-312 (August 1974).

"Thermographic Detection of Local Heating During Cyclic Loading", by J.A. Charles, F.J. Appl and J.E. Francis, presented at the 62nd Annual Meeting of the Oklahoma Academy of Science, Oklahoma City, Oklahoma (November 1973); Proceedings of the Oklahoma Academy of Science, Vol. 54, pp. 52-59 (1974).

"Using the Scanning Infrared Camera in Fatigue Studies", John A. Charles, F.J. Appl and J.E. Francis, Experimental Mechanics, Vol. 15 No. 4, pp. 133-138 (April 1975).

"Lingual-Palatal Pressure Measurement and Analysis Techniques", by H.A. Leeper, Jr., and F.J. Appl, Journal of Speech and Hearing Kesearch, Vol. 18, pp. 588-593 (September 1975).

"Fatigue Testing Composites Using Thermography", by J.A. Charles, F.J. Appl and J.E. Francis, Proceedings of the 12th Annual Meeting of Society of Engineering Science, Austin, Texas, pp. 819-828 (October 1975).

"Fatigue Damage Determination Using Thermography", J.A. Charles, J.E. Francis and F.J. Appl, Proceedings of the Second International Conference on Mechanical Behavior of Materials, Boston, MA,(Aug. 1976).

"Thermographic Determination of Fatigue Damage", J.A. Charles. F. J. Appl and J. E. Francis, Journal of Engineering Materials and Technology, Trans. ASNE, Vol. 100, No. 2, pp. 200-203, (April 1978).

"Cross-Modality Matching of Lingual Pressure to Loudness", H.A. Leeper, Jr., L. L. Feth arid F. J. Appl, Perceptual and Motor Skills, Vol. 46, pp. 911-924, (1978).

Franklin J. Appl

Teaching Experience:

The following undergraduate and graduate courses have been taught during the period 1960 to 1981: Statics, Dynamics, Strength of Materials, Strength of Materials Laboratory, Dynamics of Machinery, Kinematics, Machine Design, Design Synthesis, Stress Analysis, Experimental Stress Analysis, Theory of Elasticity, Theory of Buckling, Machanical Behavior of Materials, Theory of Plates, Aircraft Structures, Dynamic Analysis of Mechanical Systems, and Fatigue Analysis.

Patents:

United States Patent 4,651,787, March 24, 1987, "Method and Apparatus for Effectuating a Blowout."

Klementovich v Allied 4-25-26-89

Exemplar Bush Hog 105 rotary cutter
Sovart proposed guard
John Deere 950 tractor

Tests with Dummies

All tests with dummies conducted at 2mph.

	Dummy	Travel	Guard to ground	Notes
1.	5%	⊥	4"	1 arm under deck (10')
~~1a.~~	5%	⊥	~~4"~~	Completely under deck (15'↓)
2.	5%	⊥	2"	Completely under deck
3.	5%	⊥	0"	No limb under deck
4.	5%	∥	4"	Both legs under deck
5.	5%	∥	2"	Both legs under deck
6.	5%	∥	0"	Both legs under deck
7.	95%	⊥	4"	Both legs, 1 arm under deck
8.	95%	⊥	2"	Both legs, 1 arm under deck
9.	95%	⊥	0"	1 arm under deck
10.	95%	∥	4"	Both legs under deck
11.	95%	∥	2"	Both legs under deck
12.	95%	∥	0"	Both legs, 1 arm under deck
13.	95%	⊥	3" (Guard 2" above skid)	Completely under deck
14.	95%	⊥	0" (Guard 3" below skid)	Completely under deck
15.	95%	∥	0" (Guard 3" below skid)	Completely under deck

PLAINTIFF'S DEPOSITION EXHIBIT 3
5-9-89 Appl
ENGAD-Bayonne, N.J.

Field Tests

A. Guard & skid at ground level, spring growth in pecan grove. Clogged guard & stuck tractor after 101 feet of operation.

B. Guard & skid 2" above ground, spring growth in pecan grove. Made a complete round. Guard partially plugged. Grass packed down with later recovery. Very poor quality of cut

C. No guard. Skid 2" above ground, spring growth in pecan grove. Made a complete round. Excellent quality of cut.

D. Comparison of quality of cut on next day after swath cut with guard and swath cut without guard.

E. No guard. Skid 2" above ground. Wild plum bushes in pecan grove. Excellent quality of cut.

F. Guard and skid 2" above ground. Wild plum bushes in pecan grove. Guard plugged & stuck tractor in 110 feet of operation. Very poor quality of cut.

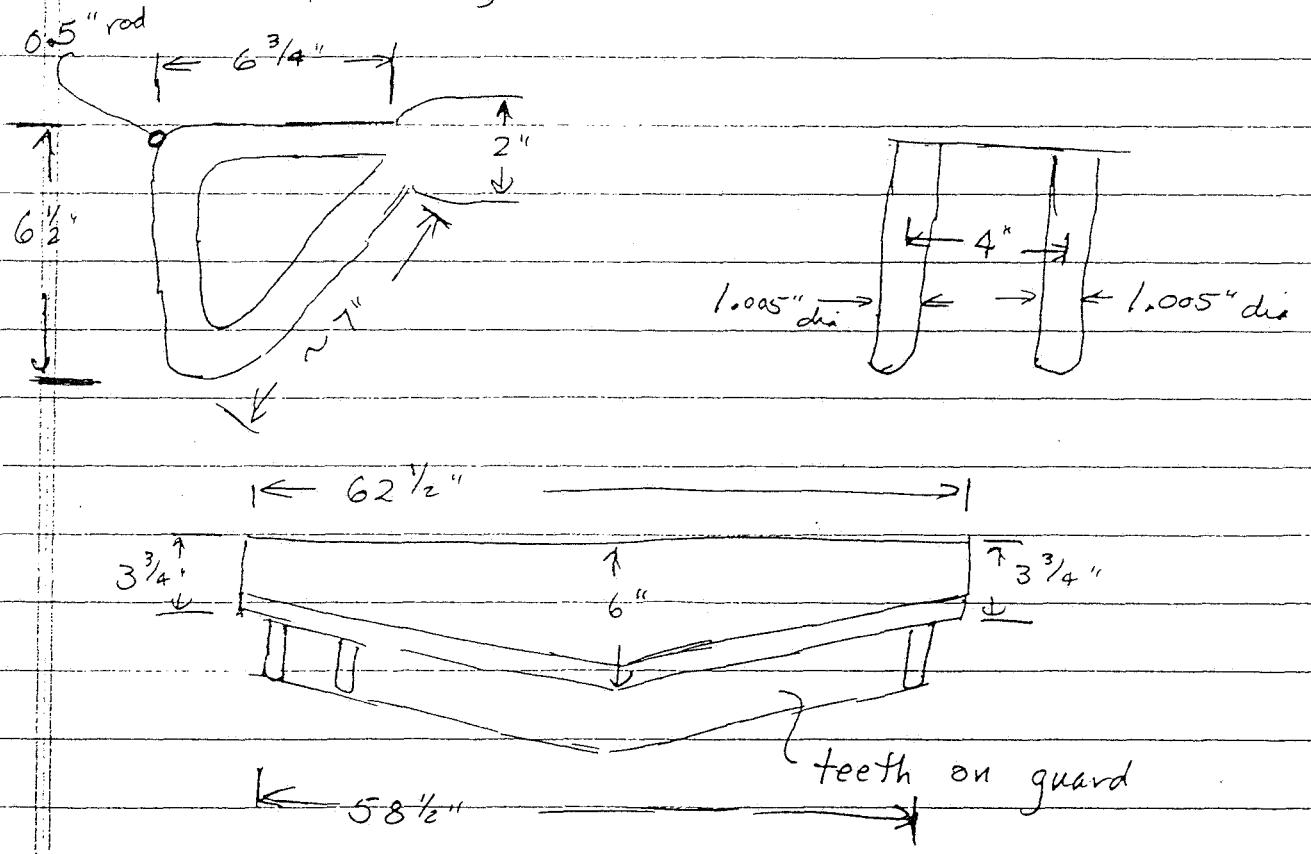
G. Guard & skid at ground level. Field with old planter rows and spring growth. Guard plugged and stuck tractor after 225 feet of operation.

H. No guard. Skid at ground level. Field with old planter rows and spring growth. Did not clog or plug. Excellent quality of cut.

Exemplar Rotary Cutter
Bush Hog 105
3 point hitch
5 foot cut

Tractor
John Deere 950
Model 3T 90J
Serial # CH 3057D 214342
~ 30 hp.

Sevart proposed guard



Test Dummies

95% - 236 lb

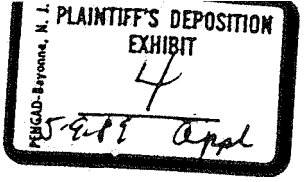
5% - 125 lb

Tractor Operator - Mark Verhoff

Bush Hog - Bill Smith

Abby - George Vernon

Video - Larry Moore



April 22, 1989

Klementovich vs Allied Products

DEPOSITION OF TED KLEMENTOVICH, FEBRUARY 7, 1989.

Pg 3. He ***is*** 57 years old and lives in Lawton, Oklahoma.

He has had his own business, Ted's Heating & Air Conditioning, since 1970.

He also owns 79 acres in southeast Oklahoma.

Pg 4. The land in southeast Oklahoma is about 22 miles east of Antlers.

He purchased the land in southeast Oklahoma in about 1972.

Pg 5. He had never spent any time **on** the land in southeast Oklahoma prior to the accident.

He purchased the land in southeast Oklahoma as an investment.

He now says that when they first purchased the land in southeast Oklahoma that they went to that land at least twice a month while setting the place up.

Pg 6. He has two daughters that are 25 and 31 years old, respectively.

His daughter, Shawna Branson, is 25 years old. His other daughter, Bridgette Morales, **is** 31 years old.

Pg 7. After purchasing the land in southeast Oklahoma, he cleaned the place up and placed a trailer on the land, built a septic tank, and built a shed.

He did not run any animals nor grow any crops on the land in southeast Oklahoma. He did plant a garden.

The land in southeast Oklahoma had a pond on it at the time he bought the land.

Pg 8. In the early 1980's, he would *go* to the land in southeast Oklahoma eight to twelve times a years and would stay two or three days at **a** time.

In the years immediately prior to his accident, he would go to the land in southeast Oklahoma three or four times a year. He would fish and hunt and cut grass.

Pg 9. The accident occurred on October 17, 1987, which was a Saturday.

He, his wife, and his grandsons, Justin Morales and Arron Morales, arrived at the land in southeast Oklahoma at about noon on the Friday prior to the accident.

Pg 10. Justin is now 13 years old and Arron is now 5 years old.

Justin had been to the land in southeast Oklahoma three times.

He began mowing just before noon on Saturday.

The accident happened at about noon on Saturday.

He believes they had been mowing for about one hour prior to the accident.

Pg 11. There was about fifteen acres of grass on the land in southeast Oklahoma.

It would take approximately 32 hours to mow the entire fifteen acres.

Justin was with him when he started mowing on Saturday.

Pg 12. Arron and his wife were **up** at the trailer at the time he

started mowing.

He believes that he showed Justin what to do to operate the tractor. He then let Justin sit in the seat and operate the steering and the power lift. He then stood between the seat and the fender on the tractor to ride with Justin.

He does not recall that Justin had ever operated the tractor before.

There were two tractors and two mowers on the land in southeast Oklahoma.

Pg 13. He had the Bush Hog hooked up to the tractor. He was using the Bush Hog mower which was red.

There was also a yellow mower on the land.

He has a friend that sometimes goes with him to mow. His friend would use the yellow mower. His friend is Jim Winfree from Lawton.

He sometimes used the yellow mower.

Pg 14. He sat in the seat of the tractor and showed Justin all of the instruments and handles and how the power lift worked. He showed Justin the gas pedal. He showed Justin the key to turn the tractor on and off.

When they started mowing, he was driving and mowing and showing Justin how to operate the tractor and mower.

Pg 15. The grass in the valley where the accident occurred was 20 to 24 inches high or less.

He was cutting the grass as low as the mower would go.

The terrain where they were mowing was flat. There were

some pine trees.

Pg 16. There was a little moisture in the area they were mowing. The area they were mowing was right below his pond.

Pg 17. Exhibit 1 shows the pond.

Exhibit 2 shows the valley.

Pg 18. Exhibit 3 is a view to the southwest and also shows the crest of the dam for the pond.

The tractor had three forward gears. The tractor did not have a high and low range.

He would generally drive the tractor in low gear while mowing.

Pg 19. He was mowing at a walking pace or slower.

He does not know the RPM of the tractor while they were mowing. He does not know if the tachometer was functioning.

He would mow in low gear to get more RPM out of the PTO.

Pg 20. If the mower started to clog up, he would push in the clutch and back up.

He does not recall ever mowing in second gear.

Pg 21. The grass was so thick that it would clog and bog down the mower if he tried to mow in second gear.

The mower was level and as low as it would go to get the lowest cut.

Pg 22. The front of the mower was as low as it could be positioned. The back of the mower was a little higher because of the rear wheel.

He never adjusted the height of the mower rear wheel.

The first time that Justin ever operated the tractor was on the day before the accident.

Pg 23. He now says that he showed Justin how to operate the tractor, where the levers were and the key on the day before the accident.

He and Justin had mowed together for 3 or 4 hours on the day before the accident. They were mowing on flat terrain, none of which is shown in Exhibits 1,2, or 3. They mowed near the trailer on the day before the accident.

The grass was not as high near the trailer a5 it was at the lower level.

Pg 24. He rode with Justin for some amount of time on the day before the accident and then Justin operated the tractor and mower by himself.

When they started mowing on the day before the accident, he was sitting in the seat and Justin was standing to the operator's left on the tractor, at the same location that he was standing when he fell off of the tractor.

Justin never sat on the seat with him.

When they first started mowing on the day before the accident, he was driving the tractor and mowing with Justin standing to his left on the tractor observing him.

Pg 25. He believes that he and Justin rode together on the tractor for approximately half of the 3 or 4 hours that they mowed on the day before the accident.

At some point, he and Justin traded places and Justin sat in the seat while he rode.

He then went to the trailer and watched Justin mow on the day before the accident.

Justin did not have any problems with the mower clogging up on the day before the accident.

Pg 26. He would store the tractor in a shed that was closer to the trailer than to the pond.

He would store the Bush Hog down in the flat part of the valley.

When he and Justin came out on the morning of the accident, he let Justin drive the tractor from the shed down to the valley to get the mower.

Pg 27. He hooked up the mower by himself.

When they started mowing on the morning of the accident, Justin was driving the tractor and he was riding on the tractor to the left side of Justin.

Pg 28. He rode with Justin on the tractor on the morning of the accident to show Justin where they were going to mow.

He now says that he hooked the tractor up to the mower on Friday, the day before the accident.

He now says that on the morning of the accident, the mower was already hooked up to the tractor which was parked up by the trailer.

He now says that on the morning of the accident, all they had to do was get on the tractor and drive to where they

were going to mow.

Pg 29. The trailer would be located off to the left of Exhibit 1.

Pg 30. The terrain slopes down from the trailer to the pond, as shown in Exhibit 1.

He now says that the location where the accident occurred is off of the photograph, Exhibit 1, to the right.

Pg 31. There was a sort of a road from the trailer down to the valley where they going to mow.

He was going to make one pass with Justin on the tractor and the mower to show Justin where to mow. He did not complete one pass.

He believes that about 1 hour passed from the time they left the trailer, got started, and started mowing until the accident occurrence.

Pg 32, When he got into the valley, he engaged the mower and started to mow around the area that he wanted Justin to mow.

He did not have any trouble keeping his balance in the position he was standing on the left side of the operator's position on the tractor, either the day before the accident or on the morning of the accident.

Pg 33. Exhibit 4 is a photograph of the tractor that he was using at the time of the accident.

He was standing between the seat and the fender. He had his left foot on the fender or running board and his right foot on the axle.

Exhibit 5 is a rear view of the subject tractor.

Pg 34. He had his left hand on the fender of the tractor and his right hand on the seat of the tractor.

He had his left foot on the running board and his right foot on the rear axle of the tractor.

Pg 35. He was facing the seat of the tractor.

There had never been a seat belt on the tractor.

He has never seen a tractor equipped with a seat belt.

He rode in the above described position for 1 or 2 hours on the day before the accident and never lost his balance during that time.

Pg 36. At the time of the accident, he reached to push a limb out of his way, missed the limb, and lost his balance.

The limb would have hit both him and Justin.

He was not ducking but was going to push the limb out of the way but he missed the limb.

The limb did not hit him.

He then fell off of the tractor.

He believes that he reached for the limb with his left hand.

Pg 37. He was holding on to the seat with his right hand when he reached for the limb.

He now says that he may have changed positions with his hand and he cannot recall at the time of the accident.

After he lost his balance, he has no further memory until they got him out from under the Bush Hog.

He believes that he fell off toward the front of the tractor because he reached out for the limb and then lost his balance. He was reaching forward at the time he lost his balance.

He does not know if a tractor wheel ran over him.

Pg 38. As he was instructing Justin how to operate the tractor and the mower, he did not warn Justin about anything that he should be careful of.

It never occurred to him that it was risky for two people to ride on the tractor.

He never thought about the mower blade being under the mower and going fast enough to injure someone that got underneath the mower.

He never thought that he would be under the mower or that he would fall off of the tractor.

Pg 39. He did not think there was any risk or any danger in operating the mower.

He believes he first began operating a tractor in Pennsylvania when he was 12 or so years old.

Pg 40. He does not believe that anyone taught him or instructed him how to use a tractor. He just watched and learned.

He believes that he bought one tractor in 1973 or 1972 shortly after he purchased the land in southeast Oklahoma.

Pg 41. He believes that he purchased the second tractor about 5 years later.

The accident occurred on the first tractor that he

purchased.

He ordered the Bush Hog at the time he bought the first tractor.

He believes he purchased the tractor and the Bush Hog from an implement dealer in Rattan.

The first tractor that he purchased was used.

Pg 42. The Bush Hog was new at the time of purchase.

He does not recall getting any brochures or owner's manual with the first tractor that he purchased. He believes he paid between $500.00 and $600.00 for the first tractor that he purchased.

He did not know how old the first tractor that he purchased was.

He purchased the first tractor to mow grass on his land in southeast Oklahoma. He does not recall if he received an operator's manual with the subject Bush Hog.

Pg 43. He does not recall what decals were on the subject Bush Hog at the time of purchase. He does recall reading decals on the subject Bush Hog.

Pg 44. He does not recall if there were caution decals on the subject Bush Hog.

Pg 45. He believes that he purchased the second tractor approximately 5 years after he purchased the first tractor. He purchased the second tractor from Kent Waller, a general contractor in Lawton. He did not receive an operator's manual with the second tractor.

He paid $1000.00 for the second tractor, a Sidewinder rotary mower, and a box blade.

Pg 46. The Sidewinder mower is the yellow mower discussed previously.

He did not receive an operator's manual for the yellow mower.

Pg 47. He did not see any decals on the yellow, Sidewinder mower other than the name Sidewinder.

He thought that he would have two tractors and two mowers so he could take a friend with him so as to get the grass cut quicker.

Pg 48. It never entered his mind that he could get run over by the mower and be severely hurt.

He believes that he would mow three or four times a year.

Pg 49. He does not recall how long it had been since he had mowed prior to the accident.

He always cut the grass as low as he could.

He would cut the grass as low as he could so he would not have to cut it as often.

Pg 51. The only maintenance that he did on the two mowers was to check the gear boxes for oil.

He put new blades on the subject Bush Hog one time and that was two or three months prior to the accident.

He had never had the mower blades sharpened before he replaced them on the subject Bush Hog.

Pg 52. He had neither sharpened nor replaced the blades on the

Sidewinder mower.

He replaced the blades on the subject Bush Hog himself.

He purchased the new blades from a dealer in Lawton.

He does not recall if the subject Bush Hog had some chains at the front.

After viewing a photograph of the subject Bush Hog, he does recall chains.

Pg 53. He had a welder put chains on the front of the subject Bush Hog because the mower would sometimes throw rocks out.

The photograph of the subject Bush Hog is Exhibit 6.

He believes he had the chains welded onto the subject Bush Hog between 4 and 7 years ago.

He put the chains on the subject Bush Hog to solve the problem of the mower throwing rocks.

Pg 54. It never occurred to him to put a sold piece across the front of the subject Bush Hog to keep the mower from throwing rocks **out.**

The only other modifications that he may have done to the subject Bush Hog was to add reinforcement or angle iron where cracks occurred.

Pg 55. He believes he may have put some chains on the Sidewinder mower.

He did not make any other changes or modifications to the Sidewinder mower.

He is not aware that anyone has mowed the land in southeast Oklahoma **since** his accident.

No one has used the subject Bush Hog since the accident.

Pg 56. He took hi5 daughter on the tractor with him one time but there was no implement on the tractor.

He had never had Justin ride on the tractor with him prior to the day before the accident.

He believes that Shawna, his youngest daughter, rode with him on the tractor when she was 10 or 11 years old,

Pg 57. Shawna rode with him on the tractor once or twice and then he showed Shawna how to drive the tractor.

He does not believe that Shawna ever mowed as a child.

He does not believe that either his wife or his other daughter, Bridgette, ever mowed.

Pg 58. He was not aware that there was a danger in someone falling off of the tractor and being hurt.

Pg 59. He had never heard of an accident wherein a tractor tipped over.

His education consists of 9 years of schooling in Pennsylvania and heat and air conditioning training at Okmulgee Tech.

Pg 60. He was born in 1932.

Pg 62. He did service and installation of heating and air conditioning systems for Home Decor and Air Conditioning for 13 or 14 years.

Pg 63. He then started his own business in 1970. Ted's Heating & Air Conditioning is a corporation with he and his wife as the sole shareholders.

He did service and installation while at Home Decor.

At Ted's he does the paperwork, blueprints, and the estimations.

Pg **64.** Ninety-nine percent of his work is tied to new construction through bidding on commercial construction.

He no longer bids on residential construction. He finds that there is more money in commercial construction.

Pg 65. He has stopped bidding on residential construction since his accident.

Some of his work is in the replacement of existing units.

Pg 66. He does not consider it part of his work in delivering and installing new heating and air conditioning units to give operator's and owner's manuals to his customers.

He does give manuals to his customers if he receives them.

Pg 69. He presently has eight employees in his business.

He probably had seven employees in his business at the time of his accident.

He does not know the gross revenue of his business for the last three years. His wife may know.

Pg 70. He went back to work about 6 months after the accident.

Pg 73. He believes that he took a bonus in 1986 to explain the large increase in income between 1985 and 1986.

From 1986 to 1987, his income showed a decrease of about $20,000.00.

Pg 74. Since he returned to work, his business has picked up considerably.

Pg 77. His next memory during the accident or after the accident was when he was under the Bush Hog. He recalls Justin getting off of the tractor. He told Justin to go get help. At that time, the tractor engine was still operating.

Pg 78. He told Justin to turn the tractor key off because Justin got excited and nervous and did not know what to do.

The tractor had hit a tree and stalled the tractor. The clutch on the tractor was slipping. Justin jumped off of the tractor by him. He told Justin to turn the tractor key off, which he did. Justin then went for help.

The tractor hit a tree and stayed there with the tractor clutch slipping. The blades of the Bush Hog were not turning.

Pg 80. He had a six pack of beer but he does not recall if he drank any beer on Friday night, the night before the accident.

Pg 81. He did not have anything to drink on the morning of the accident.

He is no longer able to run his business the way he ran it prior to the accident. He can no longer get on roofs nor can he check jobs because of the limitations of being in a wheel chair.

Pg 82. Paul Rudy now has to do the climbing onto the roof. Rudy has worked for him 9 or 10 years.

Pg 85. He is assuming that the tractor came to rest against a tree after the accident. He does not know that as a fact.

Pg 86. He believes that Justin probably turned the tractor to the right when he fell off of the tractor, otherwise he would have gone completely under the Bush Hog.

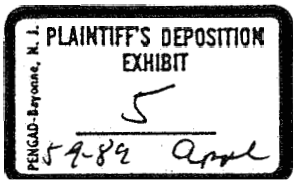
He assumes that the tractor hit something because it was stalled. He could hear the tractor motor running but the blade was not turning and the clutch on the tractor was slipping.

He believes that they were going east at the time of the accident.

Pg 87. They were going right along the side of the pond on the first swath. They were 2 or 3 feet away from the bottom of the embankment for the pond.

Pg 88. The area that is green in Exhibit 3 is the area that he had cut prior to the accident.

Pg 91. The only maintenance or service that he did on the tractors or mowers was to put gear oil in the gear box of the mowers.



April 22, 1989

Klementovich vs Allied Products

DEPOSITION OF JUSTIN MORALES, FEBRUARY 7, 1989.

Pg 4. He was born June 29, 1975.

Pg 5. He is presently in the seventh grade.

Pg 7. The first time he had operated the tractor was on the day before the accident while he helped out with the mowing.

Pg 8. He and his grandfather went out to the tractor.

He does not recall what his grandfather said to him about what he was supposed to do.

His grandfather showed him how to turn the tractor on.

Pg 9. His grandfather showed him the foot pedals on the tractor and told him what those foot pedals were for. He recalls that there were some levers on the tractor but he does not recall that his grandfather told him about how to use the levers.

He does not know if there was a lever that would raise and lower the Bush Hog.

He does not remember if there was a lever that actually started the Bush Hog turning.

Pg 11. He does not recall if the Bush Hog was attached to the tractor when he was driving the tractor on Friday, the day before the accident.

He does not remember if he cut any grass on Friday, the day before the accident.

(Pages 12–15 are missing from this copy of the deposition.)

Pg 16. His grandfather was on the left side of the tractor.

His grandfather fell in front of the tractor wheel.

The tractor wheel rolled over his grandfather.

He turned the tractor to the right after his grandfather fell.

He is not sure whether or not the tractor hit a tree or anything **else** to cause it to come to rest.

When he got off of the tractor, his grandfather told him to go back and turn the tractor off.

Pg 17. He does not recall if there was a seat belt on the tractor.

He does not recall his grandfather telling him that the mower was dangerous.

He had ridden on the tractor with his grandfather before the weekend of the accident.

Pg 18. He had not ridden with his grandfather previously while he was mowing.

The first time he had ever ridden on the tractor with the mower behind the tractor was on the day before the accident.

He had never driven the tractor before the day before the accident.

Pg 19. He had operated a walk-behind lawn mower at his house.

There was **a** four-wheeled ATV on the land.

Pg 20. He had ridden the four-wheeled **ATV.**

His father taught him how to operate the four-wheeled ATV.

He does not recall how he operated the brake on the tractor.

He does not recall whether or not the ground around the accident location was wet.

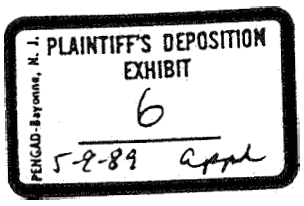
Pg 21. He does not remember whether or not the tractor stopped before he got off of the tractor.

He does not recall whether or not he applied the brakes on the tractor before he jumped off of the tractor,

He does not know if anything happened to jerk the tractor as his grandfather was reaching for the branch.

He does not recall if there were any bumps in the ground at the accident location.

Pg 22. He does not recall what a clutch is on a tractor.



April 22, 1989

Klementovich vs Allied Products

DEPOSITION OF BETTY KLEMENTOVICH, FEBRUARY 7, 1989.

Pg 3. She was married to Ted Klementovich on June 6, 1954.

Pg 4. She graduated from high school at Mangum, Oklahoma.

Pg 5. She has worked at Ted's Heating & Air since that business started in 1970.

Pg 7. She does the bookkeeping and pays the bills at Ted's Heating & Air Conditioning.

Pg 8. Ted took care of all of the bid records at Ted's.

Pg 9. Ted's is a corporation.

Jim Keiningham has worked at Ted's for about 12 years. He is the serviceman.

Pg 10. Shawna Branson (her daughter) has been the secretary at Ted's for about 1 1/2 years.

Pg 11. Paul Rudy has worked at Ted's for about 13 or 14 years. He installs equipment.

John Hillmman has worked for Ted's for 5 or 6 years. He does service work and installation.

Joe Cunningham has worked at Ted's for about 1 year. He helps with installations and with service.

Pg 12. Ray Carnahan has worked at Ted's for about 1 year.

Pg 13. Ray Carnahan helps with installations when Ted needs him.

Richard Carnahan also works part-time as extra help at Ted's.

Pg 14. Manuel Lesmada has worked at Ted's since 1988. He makes sheet metal.

She believes that service would account for one-eighth to one-fourth of the income and installation accounts for the remainder of the income at Ted's.

Pg 16. Ted Klementovich can no longer go and make estimates. He cannot check on job sites, crawl in attics, crawl under houses, or so forth. He usually has Paul Rudy do those things for him.

Pg 17. Since the accident in October, 1987, Ted's has bid on less contracts than it would have in the past.

Pg 19. Ted, she, their daughter, and their grandchildren had gone down to the southeastern part of Oklahoma.

She does not recall if Ted had worked with Justin on the tractor together and had done some mowing on the day before the accident.

She did not know that Ted and Justin had been riding on the tractor together while operating the mower at any time before the accident. She would not have objected had she known they had been riding on the tractor together.

She has never operated the tractor powered rotary mower.

Pg 20. She has never driven a tractor.

She found out about the accident from Justin. Justin came running toward the trailer and screaming. At that time, she had her four-year old grandson on a four-wheeled ATV.

Pg 22. Her son-in-law, Corry Branson, then got on the four-wheeled ATV and went to the accident site.

She also went to the accident site.

She cannot recall the position of the tractor and so forth at the accident site. She saw Ted under the Bush Hog.

Pg 23. Exhibit 1 is a sketch showing the tractor and the Bush Hog.

Pg 24. She indicates with a X approximately where Ted's head was located on the left side of the Bush Hog.

Pg 25. She loaned some money to Ted's to keep the business going after the accident.

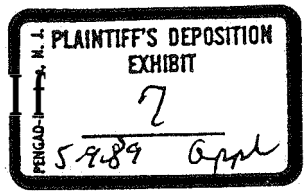
Pg 26. The employees at Ted's worked by the hour.

Ted received a salary from Ted's.

Pg 29. She never saw an operator's manual or any decals on any of the tractors or mowers.

Pg 30. Ted had not taken any medication nor drunk any alcohol on the day of the accident or the day before the accident.

Pg 31. She drove to the accident site in the pickup. Her son-in-law picked up the Bush Hog and laid it on her daughter's legs to hold the Bush Hog up. Her son-in-law then pulled Ted out from under the Bush Hog, put Ted in the back of the pickup, and drove Ted to Antlers, which was 22 miles away.



May 8, 1989

Klementovich vs Allied Products

DEPOSITION OF JOHN B. SEVART, APRIL 3, 1989.

Pg 4. He is a licensed professional engineer in private practice. He is affiliated with Advance Technology, Inc. and Outdoor Services, Inc.

Pg 5. He is appearing at the deposition as a representative as J.B. Sevart, P.E., a professional engineering firm.

Pg 6. Several years ago, Advance Technology had a research project concerned with frontal guarding of rotary field mowers and did some development work in that regard and built two or three prototypes. The bulk of that work was done by 1983.

That work is reported in ATI Report 309910 entitled Rotary Field Mower Intake Guard Development.

Pg 7. He has a videotape of testing of the frontal guard by Allied in 1983.

He has a videotape of an ATI test of the frontal guard from 1986.

He has a videotape of the accident site and the subject equipment.

Pg 9. Among the materials that he has are a one page summary entitled Fact Sheet that he prepared in preparation for this deposition, a one page description of the machinery and the accident, illustrations of the accident, summaries of the depositions of Mr. and *Mrs.* Klementovich and Justin Morales, a field report of the inspection, information

entitled Accident Statistics, materials entitled Foreseeability of Riders, materials entitled Mower Guarding Information, materials entitled ATI Intake Guarding, materials from Bush Hog, materials on warnings, materials on standards, and operator's manual for a Ford 8N tractor.

Pg 10. He has a packet of price lists and manuals for the 105 series rotary cutter. He has drawings and blueprints of Bush Hog cutters.

Pg 11. He does not know if he has produced everything that he has in his possession concerning the Sevart proposed guard.

Pg 14. He does not believe that the questions of operator presence sensing devices, ingress and egress hand grips, or kill switches as equipment for tractors is relevant to this lawsuit.

Pg 16. He has not produced all documents related to proposed warnings that he has drafted or designed for proposed use on rotary mowers or in field rotary mower manuals.

Pg 19. During 1985 through 1988, the gross income of J.B. Sevart, P.E. and ATI would have been more than 50% but less than 70% derived from matters in litigation or potentially in litigation.

Pg 22. He believes that less than half of his personal, professional income is derived through ATI.

He currently has approximately 160 open cases.

Pg 23. His current case load is approximately 70% of his load three or four years ago.

He did not examine the accident site. He had the accident site examined by Hull, an investigator.

Pg 24. Hull did not operate the subject tractor and subject mower together.

Hull looked at the subject equipment and photographed the subject equipment.

Pg 25. He instructed Hull not to mow with the subject tractor and subject mower because the equipment was not safe to be used.

Pg 26. The subject mower is unguarded and has questionable guarding on the drive line.

The subject tractor has no roll bars and no seat belt.

He has no information as to whether or not there was a second tractor or second mower at the accident site at the time Hull made his inspection.

Pg 29. Exhibit 3 a drawing that he had prepared showing two people on the tractor prior to the accident.

Exhibit 4 is a drawing that he had prepared showing two people on the tractor after the accident started.

The two people shown in Exhibit 4 would be in approximately the same location at the conclusion of the accident.

Pg 30. He does not know why the subject tractor stopped during the accident.

He does not know the exact position of the plaintiff when the tractor stopped.

Pg 31. Exhibit 5 are his notes describing the accident.

In his opinion, the tractor was going approximately 2 mph at the time of the accident.

Pg 32. He believes that the subject tractor was in first gear and operating at less than full throttle but more than half throttle at the time of the accident. He bases that opinion on Klementovich's deposition and his understanding of the operation of the machine.

The Ford 8N manual indicates a maximum unloaded speed in low of 3.69 mph.

Pg 33. His understanding is that the subject tractor has a mechanical transmission with one range and three gears forward.

His understanding is that the subject tractor has a 540 rpm PTO output shaft.

He does not know if the subject tractor had both engine drive and ground drive PTO.

Pg 34. He believes that Ford 8N tractors were generally made between 1947 and 1952.

His opinions are not dependent upon whether the subject tractor was in ground drive or engine speed PTO at the time of the accident.

Pg 36. His understanding is that the accident location was level terrain.

His understanding is that Klementovich fell slightly forward and to the left such that the rear left tractor wheel passed over his legs and the mower deck went over his

legs.

Pg 37. He believes that Rlementovich probably fell face down. He believes that the major injuries were associated with the legs and the balance of the injuries were created by the left edge of the mower deck coming over the torso,

Pg 38. His understanding is that the subject tractor came to rest against a tree at the conclusion of the accident. In his opinion, the subject tractor was turned to the right as a panic reaction by Morales to get away from his grandfather.

Pg 39. He believes that the tractor manual indicates that if the clutch slips that the PTO would stop whether or not the PTO were in ground drive or engine speed.

Pg 40. If the subject tractor had a live PTO, the PTO would continue to operate even if the transmission clutch was slipping.

Pg 41. His understanding is that Klementovich had the subject mower in the lowest cutting position and was cutting grass and vegetation that was 20 to 24 inches high. In his opinion, that was an appropriate height to cut the vegetation that was present. Exhibits 7, 8, and 9, are his deposition summaries. His vita is Exhibit 13.

Pg 42. Exhibit 15 is a fact sheet that he has prepared.

Pg 43. Exhibit 16 is a folder he has prepared entitled Accident Statistics. That folder contains a list of field mower

accidents that he has investigated from 1978 through 1985. Field mower accidents generally fall into three categories, blade contact, thrown objects, and PTO entanglement.

Pg 45. He would *say* that he expresses an opinion that the product was defective in less than half of his retentions. Approximately 10% of his retentions are by defendants. He finds approximately half of those products defective and half not defective.

Pg 46. He agrees to testify in less than half of his retentions, whether those retentions are for plaintiff or defendant.

Pg 47. Exhibit 17 is a packet of information concerning foreseeability of riders.

He would not agree that a seat wide enough for two people would be a good idea, even though such an idea was expressed by **NSC** in 1943.

Pg 48. He believes that the procedure outlined by Wilsy €or training new tractor operators is a good procedure as long as there is no implement attached to the power take-off and the tractor has a hitch.

Pg 49. His father taught him to drive a tractor in **1945** while standing on the hitch.

When his father wanted to show him how to operate a tractor with an implement, his father sat on the fender.

Pg 50. In his opinion, a tractor manual should have included instruction about how to train a new operator.

His understanding is that **Klementovich was a 55** year **old**

man who operated the subject tractor three or four times a year for a matter of a few hours each time for about 15 years.

Pg 51. He believes it was reasonable for Klementovich to permit his grandson to ride with him on the tractor.

He saw similar type of conduct every summer while he was on the farm.

As an engineer, he would not recommend that children ride on tractors, but he believes it is not an unusual practice, even today.

Pg 42. He believes it would be reasonable that Klementovich would not appreciate the true nature of the risk.

Pg 53. In his opinion, Klementovich did not appreciate the risk of what could happen if he got run over by the mower.

In his opinion, Klementovich should have read the operator's manual for the mower, provided that he received an operator's manual with the mower.

Pg 54. If Klementovich received an operator's manual with the mower but did not read the manual, he would then criticize that conduct.

Pg 55. He has a blueprint of a caution decal. That decal is inadequate. That decal does not give any indication of the consequences of not following the warnings. That decal also mixes hazards by addressing thrown objects, PTO entanglement, and blade contact in the same warning.

Pg 56. He believes that there should have been three separate

decals for the three hazards.

He believes that the signal word of the warnings was improper. The level of warning should have been danger rather than caution.

He believes it would be necessary to have a warning indicating that if a person were run over by the Bush Hog while it was in operation that the person would risk serious injury or death.

Pg 59. He believes that the warning should have been done with words or pictographs.

He believes that there should have been a warning to operate the mower only with tractors equipped with roll bars and seat belts.

He believes that there should be a fourth panel indicating a consequence of not following the warnings.

Pg 60. He has not attempted to write a specific warning for this mower.

The first panel of the warning should say “Danger”.

The second panel of the warning should be a descriptive or pictorial depiction of the risk of blade contact injury.

The third panel would indicate the do’s and the don’ts, one of which would be to not allow any riders on the tractor or mower and one would be to not operate the mower with a tractor not equipped with roll bar and seat belt.

The forth panel of the warning would be a list of consequences of not following the warning.

Pg 62. The subject mower had no warning decal when it was examined by Hull.

In his opinion, Allied should have provided a more durable warning that would last 20 years or more.

The warning could have been written on metal and attached to the mower in a similar manner to the serial plate.

Pg 64. Current decals use a durable plastic with oxidation resistent adhesive.

Pg 65. He believes that both John Deere and IHC were using plastic decals with oxidation proof adhesives in 1970.

He does not know if plastic decals with oxidation proof adhesives will be 100% legible if left out in the elements for 16 years.

Pg 67. He believes that decals for field rotary mowers should last at least 25 years.

Pg 68. He would not allow his grandchild to ride on a tractor that he driving while pulling a field rotary mower if that tractor did not have a cab.

He does not criticize Klementovich for allowing his grandchild to ride on the tractor without a cab.

He believe that he has a better understanding of the consequences and accidents due to his technical training than Klementovich would have.

Pg 69. He believes that the subject mower is defective in design relative to safety and human factors considerations.

In his opinion the hazard of blade contact was well known

prior to 1972.

Pg 70. He believes it was possible for Allied to have provided far more adequate guarding to reduce the risk of blade entanglement.

In his opinion, if the subject mower had been equipped with any type of frontal guard, Klementovich would not have experienced blade contact.

He has not designed nor tested any frontal guards that are not reflected in the ATI Report, Exhibit 18.

Pg 71. He has a folder entitled Mower Guarding information.

Pg 72. His records of testing of the Sevart proposed guard consists of a videotape from the summer of 1986 and several photographs of an area mowed in 1983.

He does not have any photographs indicating mowing without the guard.

Pg 74. Exhibit 20 is a document generated by Bush Hog, 1983, summarizing testing of a guard developed by Bush Hog from a Sevart paper of 1982.

Pg 75. Exhibit 25 consists of various documentation of warnings.

Pg 77. He believes that the subject mower violates Article B.15 from the 1972 AE Yearbook concerning the expected standard of care in the design of a product and the proper regard for the safety, health and welfare of the public by engineers.

In his opinion, safety was not a major consideration in the design of the subject mower. He bases that opinion on a

comparison of the subject mower against safety features that were available including guarding and improved warnings.

Pg 78. He believes that Allied should have included a clutch in the drive line that would permit power to be transmitted in only one direction so as to allow the tractor to drive the mower but not allow the mower to drive the tractor.

The only safety feature that he found on the subject mower was a tubular shielding of the drive line.

A chain guard was added by Klementovich.

He is not aware of any warning ever being on the subject mower.

A portion of the drive line on the subject mower was unguarded.

The subject mower had no single direction clutch.

Pg 79. His understanding is that there was no master shield on the gear box at the time the subject mower was sold.

He believes that Bush Hog sold the subject mower without drive shaft.

Pg 80. He believes that John Deere, BMB, Rhino Caldwell, Woods Brothers and Sunmaster, in addition to Bush Hog, were manufacturing field rotary mowers in 1973.

Of the above manufacturers of mowers, he believes that only John Deere provided any kind of frontal guarding. That guarding consisted of a metal plate that went across the front of the mower and extended to approximately 1 inch

from the bottom of the skids.

Pg 81. He does not have any literature depicting that John Deere mower with guard.

Pg 82. In his opinion, Bush Hog has been aware of blade contact accidents for at least 20 years but has done nothing to improve the safety level of the mower or to issue retroactive warnings or to make available frontal guards.

Pg 89. It would have been technologically feasible for the subject tractor to have been manufactured with a kill switch in the seat of the tractor.

Pg 90. In his opinion, a tractor kill switch should not restart or permit the engine to restart if the operator is off the seat more than half a second.

Pg 91. Kits for kill switches for tractor seats are commercially available today. Those kits are not designed for a Ford 8N tractor.

Pg 92. It would not be infeasible to design a kill switch kit for a Ford 8N tractor.

He believes that the subject tractor engine would continue to operate for four or five seconds after the seat was vacated if that tractor had been equipped with a kill switch.

He believes that the subject tractor would have moved forward 10 or 12 feet after the kill switch was activated had the subject tractor been equipped with a kill switch **and** been operating a 2 mph.

Pg 93. He does not have an opinion as to whether or not the subject tractor was defective by reason of absence of a kill switch.

He is generally an advocate of the use of kill switches on agricultural tractors.

Pg 94. He cannot find any use for an agricultural tractor that requires the engine to be operating with the transmission engaged but no operator in the seat. He believes that the way to prevent such operation would be to have an operator presence sensing system.

Pg 96. He believes that even if the subject tractor had been equipped with a seat kill switch and Morales have stood up when his grandfather fell, that Klementovich would still have gone under the mower deck.

Pg 98. In his opinion, the subject tractor should have had hand holds for getting on and getting off of the tractor.

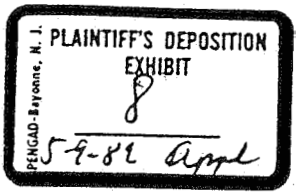
He does not have an opinion concerning the adequacy of the steps or running board on the subject tractor.

Pg 100. He does not believe that hand grips on the cowling or the fender of the subject tractor would have prevented the present accident.

His understanding is that Klementovich lost his balance when he released his grip on the fender and seat. Klementovich released his grip to reach for a limb. He does not believe it would have made any difference if there had been a hand hold on the fender that Klementovich would

have continued to hold on to.

Pg 101. His understanding is that Klementovich is not positive which hand he used to reach out to the limb. The closest hand was the left hand.



May 4, 1989

Klementovich vs Allied Products

The following photographs, 1-126, were taken by F.J. Appl on April 25 and 26, 1989 during testing of the Sevart proposal guard for a Bush Hog 105 rotary mower. These tests were conducted in the vicinity of Selma, Alabama.

Photograph 1. A view of the test area used during the dummy tests is shown. The two markers are ten feet apart. The dummy shown is a five percentile dummy and is laid perpendicular to the path of travel of the tractor and mower.

Photograph 2. A view from the right of the exemplar Bush Hog 105 rotary mower, the Sevart proposed guard, and a John Deere 950 tractor is shown.

Photograph 3. A closer view from the right of the proposed guard is shown.

Photograph 4. A view from the rear of the exemplar mower equipped with the proposed guard is shown.

Photograph 5. A view from the right of the Sevart proposed guard positioned 4 inches above the ground in preparation for a perpendicular test with the five percentile dummy is shown.

Photograph 6. A view from the right during the test described in Photograph 5 is shown.

Photograph 7. Another view similar to that described in Photograph 6 is shown. One arm of the dummy is underneath the deck of the mower.

Photograph 8. A view of the result of a repetition of the test described in Photograph 5 with the test course extended to a length of 15 feet is shown. In this test, the dummy went completely under the guard.

Photograph 9. A view from the right of the Sevart proposed guard positioned 2 inches above the ground in preparation for a perpendiculartest with the five percentile dummy is shown.

Photograph 10. A view from the right during the test described in Photograph 9 is shown. The dummy went completely underneath the guard.

Photograph 11. A view from the right at the conclusion of the test described in Photograph 9 is shown.

Photograph 12. A view from the right of the Sevart proposed guard located at ground level in preparation for a perpendicular test with the five percentile dummy is shown.

Photograph 13. A view along the path of travel in preparation for the test described in Photograph 12 is shown.

Photograph 14. A view from the right during the test described in Photograph 12 is shown.

Photograph 15. A view from the right at the conclusion of the test described in Photograph 12 is shown. The dummy did not go under the guard in this test.

Photograph 16. Aview from the right of the Sevart proposed guard positioned 4 inches above the ground in

preparation for a parallel test of the five percentile dummy is shown.

Photograph 17. A view from the right during the test described in Photograph 16 is shown.

Photograph 18. A view from the right at the conclusion of the test described in Photograph 16 is shown.

Photograph 19. A right rear quarter view at the conclusion of the test described in Photograph 16 is shown. Both legs of the dummy went under the guard and under the deck of the mower in this test,

Photograph 20. A view from the right of the Sevart proposed guard positioned 2 inches above the ground in preparation for a parallel test on the five percentile dummy is shown.

Photograph 21. A view from the right during the test described in Photograph 20 is shown.

Photograph 22. A right rear quarter view at the conclusion of the test described in Photograph 20 is shown.

Photograph 23. A view from the right at the conclusion of the test described in Photograph 20 is shown. Both legs of the dummy went under the guard and under the deck of the mower in this test.

Photograph 24. A view from the right of the Sevart proposed guard positioned at ground level in preparation for a parallel test of the five percentile dummy is shown.

Photograph 25. A view from the right during the test described in Photograph 24 is shown.

Photograph 26. A right rear quarter view at the conclusion of the test described in Photograph 24 is shown. Both legs of the dummy went under the guard and under the deck of the mower during this test.

Photograph 27. A view from the right of the Sevart proposed guard positioned 4 inches above the ground in preparation for the perpendicular test of the 95 percentile dummy is shown.

Photograph 28. A view from the right during the test described in Photograph 27 is shown.

Photograph 29. A view from the right at the conclusion of the test described in Photograph 27 is shown.

Photograph 30. Another view from the right at the conclusion of the test described in Photograph 27 is shown.

Photograph 31. Another view from the right at the conclusion of the test described in Photograph 27 is shown. The entire dummy went under the guard and both legs and one arm were under the deck of the mower at the conclusion of this test.

Photograph 32. A view from the right of the Sevart proposed guard located 2 inches above the ground in preparation for a perpendicular test of the 95 percentile dummy is shown.

Photograph 33. A view from the right during the test described

in Photograph 32 is shown.

Photograph 34. A view from the right at the conclusion of the test described in Photograph 32 is shown. The entire dummy passed under the guard and both legs and one arm were under the mower deck at the conclusion of this test.

Photograph 35. A view from the right of the Sevart proposed guard located at ground level in preparation for a perpendicular test of the 95 percentile dummy is shown.

Photograph 36. A view of the test course and the 95 percentile dummy in preparation for the test described in Photograph 35 is shown.

Photograph 37. A view from the right during the test described in Photograph 35 is shown.

Photograph 38. A view from the right at the conclusion of the test described in Photograph 35 is shown.

Photograph 39. A closer view from the right at the conclusion of the test described in Photograph 35 is shown. One arm of the dummy was under the mower deck at the conclusion of this test.

Photograph 40. A view from the right of the Sevart proposed guard located 4 inches above the ground in preparation for a parallel test of the 95 percentile dummy is shown.

Photograph 41. A view from the right during the test described in Photograph 40 is shown.

Photograph 42. A right rear quarter view at the conclusion of the test described in Photograph 40 is shown.

Photograph 43. A right rear quarter view at the conclusion of the test described in Photograph 40 is shown. Both legs of the dummy were under the guard and under the mower deck at the conclusion of this test.

Photograph 44. A view from the right of the Sevart proposed guard located 2 inches above the ground in preparation for a parallel test of the 95 percentile dummy is shown.

Photograph 45. A view from the right during the test described in Photograph 44 is shown.

Photograph 46. A view from the right at the conclusion of the test described in Photograph 44 is shown. Both legs of the dummy were under the guard and under the mower deck at the conclusion of this test.

Photograph 47. A view from the right of the Sevart proposed guard located at ground level in preparation for a parallel test with the 95 percentile dummy is shown.

Photograph 48. A view from the right during the test described in Photograph 47 is shown.

Photograph 49. A view from the right at the conclusion of the test described in Photograph 47 is shown. Both legs and one arm of the dummy were underneath the mower deck at the conclusion of this test.

Photograph 50. A view from the right of the Sevart proposed guard positioned 2 inches above the skid and with the skid at ground level in preparation for a perpendicular test of the 95 percentile dummy is shown.

Photograph 51. A view from the right during the test described in Photograph 50 is shown.

Photograph 52. A view from the right during the test described in Photograph 50 is shown.

Photograph 53. A view from the rear at the conclusion of the test described in Photograph 50 is shown. The dummy passed entirely beneath the guard and the mower deck during this test.

Photograph 54. A view from the right of the Sevart proposed guard located 3 inches below the skid level of the mower and with the guard located at ground level in preparation for a perpendicular test of the 95 percentile dummy is shown.

Photograph 55. A view from the right during the test described in Photograph 54 is shown.

Photograph 56. A view from the right at the conclusion of the test described in Photograph 54 is shown. The dummy passed beneath the guard and the deck of the mower during this test.

Photograph 57. A view from the right of the Sevart proposed guard located 3 inches below the skid of the mower and with the guard at ground level in preparation for

a parallel test of the 95 percentile dummy is shown.

Photograph 58. A view from the right during the test described in Photograph 57 is shown.

Photograph 59. A view from the rear at the conclusion of the test described in Photograph 57 is shown. The dummy passed under the guard and was completely under the mower deck at the conclusion of the this test.

Photograph 60. A view of the exemplar Bush Hog 105 mower operating without guard and with the skid of the mower at ground level in a pecan grove is shown.

Photograph 61. A view from the right during the test described in Photograph 60 is shown.

Photograph 62. A view from the right during the test described in Photograph 60 is shown.

Photograph 63. A view from the right during the test described in Photograph 60 is shown.

Photograph 64. A view from the rear during the test described in Photograph 60 is shown.

Photograph 65. A view of the quality of the cut produced during the test described in Photograph 60 is shown.

Photograph 66. A view from the right of the Sevart proposed guard positioned at ground level in preparation for a mowing test in the pecan grove is shown.

Photograph 67. A view from the right during the test described in Photograph 66 is shown.

Photograph 68. A view from the right during the test described in Photograph 66 is shown.

Photograph 69. A view from the right during the test described in Photograph 66 is shown.

Photograph 70. A right rear quarter view during the test described in Photograph 66 is shown. Materials have gathered in front of the guard to the extent that the wheels of the tractor are beginning to slip in this photograph.

Photograph 71. A view from the rear at the conclusion of the test described in Photograph 66 is shown.

Photograph 72. A view from the rear at the conclusion of the test described in Photograph 66 is shown,

Photograph 73. Aview from the rear at the conclusion of the test described in Photograph 66 is shown.

Photograph 74. A view from the right at the conclusion of the test described in Photograph 66 is shown.

Photograph 75. A view from the right at the conclusion of the test described in Photograph 66 is shown.

Photograph 76. A view from the rear after the Sevart proposed guard was removed from the mower in order to extricate the tractor at the conclusion of the test described in Photograph 66 is shown.

Photograph 77. A right rear quarter view of the Sevart proposed guard and the materials gathered by the guard during the test described in Photograph 66 is shown.

Photograph 78. A view of the path of travel during the entire test described in Photograph 66 is shown. The Sevart proposed guard clogged completely and stuck the tractor after 101 feet of travel during the test described in Photograph 66 is shown.

Photograph 79. A view of the Sevart proposed guard positioned 2 inches above the ground in preparation for a mowing test in the pecan grove is shown.

Photograph 80. Another view similar to that described in Photograph 79 is shown.

Photograph 81. A view from the right during the test described in Photograph 79 is shown.

Photograph 82. A right rear quarter view after one round of the test described in Photograph 79 is shown.

Photograph 83. A left rear quarter view of the material gathered in the guard at the conclusion of the test described in Photograph 79 is shown.

Photograph 84. A view of the material stuck and gathered in the guard at the conclusion of the test described in Photograph 79 is shown.

Photograph 85. Another view similar to that described in Photograph 84 is shown.

Photograph 86. A view of a comparison of the quality of cut for one swath made with the exemplar mower without guard and one swath made with the exemplar mower equipped with the Sevart proposed guard is shown. The swath cut without guard is at the right and

the swath cut with guard is at the left.

Photograph 87. Another view similar to that described in Photograph 86 is shown.

Photograph 88. A view of a comparison of the quality of cut produced by the exemplar mower without guard and by the exemplar mower with guard is shown. The swath cut without guard is at the right and the swath cut with guard during the test described in Photograph 79 is at the left.

Photograph 89. Another view similar to that described in Photograph 88 is shown.

Photograph 90. Another view similar to that described in Photograph 88 is shown.

Photograph 91. A view of a mowing test of the mower without guard and with the skid positioned 2 inches above the ground in the pecan grove is shown.

Photograph 92. A view from the left during the test described in Photograph 91 is shown.

Photograph 93. A view of the quality of cut produced in three different swaths of the exemplar mower is shown. The swath at the right was cut by the mower with skid at ground level and no guard. The swath in the middle was cut by the exemplar mower with Sevart proposed guard positioned 2 inches above the ground. The swath at the left was cut by the exemplar mower without guard with the skid positioned 2 inches above the ground.

Photograph 94. Another view similar to that described in Photograph 93 is shown.

Photograph 95. Another view similar to that described in Photograph 93 is shown.

Photograph 96. A view of a comparison of the quality of cut produced in the three swaths as described in Photograph 93 as they appeared on the day after cutting.

Photograph 97. Another view similar to that described in Photograph 96 is shown.

Photograph 98. A view of the exemplar mower without guard and with the skid positioned 2 inches above the ground mowing through some wild plum bushes is shown.

Photograph 99. Another view during the test described in Photograph 98 is shown.

Photograph 100. Another view during the test described in Photograph 98 is shown.

Photograph 101. A view of the quality of cut during the test described in Photograph 98 is shown.

Photograph 102. A view of the quality of cut during the test described in Photograph 98 is shown.

Photograph 103. A view of the quality of cut during the test described in Photograph 98 is shown.

Photograph 304. A view from the rear of the Sevart proposed guard positioned 2 inches above the ground in preparation for a test mowing plum bushes as described in Photograph 98 is shown.

Photograph 105. A view from the right in preparation for the test described in Photograph 104 is shown.

Photograph 106. A view of a comparison of the quality of cut produced by the exemplar mower with the Sevart proposed guard and without the guard is shown. The swath cut with the exemplar mower equipped with the Sevart proposed guard is at the right and the swath cut by the exemplar mower without guard is at the left.

Photograph 107. Another view similar to that described in Photograph 106 is shown.

Photograph 108. A view from the rear at the conclusion of the test described in Photograph 104 is shown.

Photograph 109. A left rear quarter view at the conclusion of the test described in Photograph 104 is shown.

Photograph 110. A view from the left at the conclusion of the test described in Photograph 104 is shown,

Photograph 111. A view of the Sevart proposed guard that had to be removed to extricate the tractor at the conclusion of the test described in Photograph 104 is shown.

Photograph 112. A view of the materials gathered by the Sevart proposed guard during the test described in Photograph 104 is shown. The total distance traveled during the test described in Photograph 104 until the guard plugged and stuck the tractor was 110 feet.

Photograph 113. A view from the right of the Sevart proposed guard located at ground level in a field with old planter furrows, old growth and new growth is shown.

Photograph 114. A right rear quarter view during the test described in Photograph 113 is shown.

Photograph 115. A view from the rear at the conclusion of the test described in Photograph 113 is shown.

Photograph 116. A view of the materials gathered by the Sevart proposed guard before causing the tractor to spin the wheels and stick at the conclusion of the test as described in Photograph 113 is shown.

Photograph 117. A view from the rear at the conclusion of the test described in Photograph 113 is shown.

Photograph 118. A view of the Sevart proposed guard which had to be removed from the exemplar mower to extricate the tractor at the conclusion of the test described in Photograph 113 is shown.

Photograph 119. Another view similar that described in Photograph 118 is shown. The distance travelled during the test of Photograph 113 before the guard plugged and caused the tractor to spin and stick was 75 yards.

Photograph 120. A view of the exemplar mower without guard and with the skid at ground level in the field described at Photograph 113 is shown.

Photograph 121. A right rear quarter view of the mower with the skid set at ground level in preparation for the test described in Photograph 120 is shown.

Photograph 122. A view from the rear during the test described in Photograph 120 is shown. The exemplar mower without guard did not clog nor jam nor cause the tractor to stick even while operating with the skids at ground level in this field with old planter furrows.

Photograph 123. An overall frontal view of the Sevart proposed guard is shown.

Photograph 124. A view from the right of the Sevart proposed guard is shown.

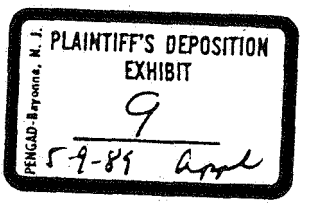
Photograph 125. A view of the bottom of the Sevart proposed guard is shown.

Photograph 126. A view of the top of the Sevart proposed guard is shown.

APPL ENGINEERING COMPANY
CONSULTING ENGINEERS
3503 CHARLESTON ROAD
NORMAN OKLAHOMA 73069

OFFICE 405/329-2900
HOME 405/321-4182

May 5, 1989



Mr. George Vernon
Keck, Mahin & Cate
8300 Sears Tower
233 S. Wacker Dr.
Chicago, IL 60606-6589

Re: Klementovich vs Allied Products

Dear Mr. Vernon:

One copy of a photograph commentary to accompany the photographs sent to you on May 4, 1989 is enclosed.

Sincerely yours,

Franklin J. Appl

FJA/ss

Enclosure

APPL ENGINEERING COMPANY
CONSULTING ENGINEERS
3503 CHARLESTON ROAD
NORMAN OKLAHOMA 73069

OFFICE 405/329-2900
HOME 405/321-4182

May 5, 1989

Mr. Gary S. Nelson
110 Pershing Ave.
College Station, TX 77840

Re: Klementovich vs Allied Products

Dear Mr. Nelson

One copy of a photograph commentary to accompany the photographs sent to you on May 4, 1989 is enclosed.

Sincerely yours,

Franklin J. Appl

FJA/ss

Enclosure

APPL ENGINEERING COMPANY
CONSULTING ENGINEERS
3503 CHARLESTON ROAD
NORMAN OKLAHOMA 73069

OFFICE 405/329-2900
HOME 405/321-4182

May 4, 1989

Mr. Gary S. Nelson
110 Pershing Ave.
College Station, TX 77840

Re: Xlementovich vs Allied Products
Bowlan vs Allied Products

Dear Mr. Nelson:

Copies of videotapes of our testing of the Sevart guard on a Bush Hog 105 (mower with chain on top) for the Klementovich case and on a Bush Hog 206 (mower with no chain on top) for the Bowlan case are enclosed.

Copies of my photographs on Klementovich are enclosed.

Sincerely yours,

Franklin J. Appl

FJA/ss

Enclosure(s)

APPL ENGINEERING COMPANY
CONSULTING ENGINEERS
3503 CHARLESTON ROAD
NORMAN OKLAHOMA 73069

OFFICE 405/329-2900
HOME 405/321-4182

May 4, 1989

Mr. Gary S. Nelson
110 Pershing Ave.
College Station, TX 77840

Re: Klementovich vs Allied Products
Bowlan vs Allied Products

Dear Mr. Nelson:

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Copies of my photographs on Klementovich are enclosed.

Sincerely yours,

Franklin J. Appl

FJA/ss

Enclosure(s)

LAW OFFICES OF

KECK, MAHIN & CATE

A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

8300 SEARS TOWER
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HOUSTON, TEXAS
PEORIA, ILLINOIS
OAKEROOK TERRACE, ILLINOIS
SCHAUMBURG, ILLINOIS

May 3, 1989

FILE NUMBER 06236-015
DIRECT DIAL (312) 876-6105

VIA FEDERAL EXPRESS

Dr. Franklin J. Appl
Appl Engineering Company
3503 Charleston Road
Norman, Oklahoma 73069

Re: Klementovich v. Allied Products Corp.

Dear Frank:

Enclosed are the exhibits that were marked at the deposition of John Sevart.

Best regards,

KECK, MAHIN & CATE

By: George Vernon

GV/mp

Enclosure

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(312) 954-2100

1699 E. WOODFIELD ROM
SUITE 206
SCHAUMBURG, ILLINOIS 60173-4933
(312) 330-1200

FILE NUMBER 06236-015
DIRECT DIAL (312) 876-6105

April 5, 1989

Dr. Franklin J. Appl
Appl Engineering Company
3503 Charleston Road
Norman, Oklahoma 73069

Re: Klementovich V. A lied Products Corp.

Dear Frank:

Enclosed is page 57 of the plaintiff's deposition in the above case.

Very truly yours,

KECK, MAHIN & CATE

By: George Vernon (mp)
George Vernon

GV/mp

Enclosure

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SCHAUMBURG, ILLINOIS 60173-4933
(312) 330-1200

FILE NUMBER 06236-015
DIRECT DIAL (312) 876-6105

March 31, 1989

Dr. Franklin J. **Appl**
Appl Engineering Company
3503 Charleston Road
Norman, Oklahoma 73069

Re: Klementovich v. Allied Products Corporation

Dear Frank:

Enclosed are copies of the depositions of Ted Klementovich, Betty Klementovich and Justin Morales in the above case.

Very truly yours,

KECK, MAHIN & CATE

By: George Vernon

GV/mp

Enclosures

LAW OFFICES OF
KECK, MAHIN & CATE
A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

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(312)330-1200

FILE NUMBER 06236-015
DIRECT DIAL (312) 876-6105

March 16, 1989

Dr. Franklin J. Appl
Appl Engineering Company
3503 Charleston Road
Norman, Oklahoma 73069

Re: Xlementovich v. Allied Products Corporation

Dear Dr. Appl:

Enclosed are three photographs of a prototype Sevart guard. Please call me once you have had a chance to review them,

Very truly yours,

KECK, MAHIN & CATE

By: George Vernon

GV/mp

Enclosures

APPL ENGINEERING COMPANY
CONSULTING ENGINEERS
3503 CHARLESTON ROAD
NORMAN OKLAHOMA 73065

OFFICE 405/329-2900
HOME 405/321-4182

February 24, 1989

Mr. Gary S. Nelson
110 Pershing Ave.
College Station, TX 77840

Re: Klementovich vs Allied Products

Dear Mr. Nelson:

A copy of a videotape by Sevart is enclosed, pursuant to the request of George Vernon.

Sincerely yours,

Franklin J. Appl

FJA/ss

Enclosure

LAW OFFICES OF
KECK, MAHIN & CATE
A PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

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SCHAUMBURG, ILLINOIS 60173-4933
(312) 330-1200

FILE NUMBER 06236-015
DIRECT DIAL (312) 876-6105

February 13, 1989

Dr. Franklin J. Appl
Appl Engineering Company
3503 Charleston Road
Norman, Oklahoma 73069

Re: Klementovich v. Allied Products Corporation

Dear Dr. Appl:

I was glad to have had the opportunity to meet with you and Mike Noland on Monday evening. In order to advance the ball a little further in your evaluation of whether you can of assistance to us, I am enclosing a paper written by Mr. Sevart on his rotary mower guard, as well as a copy of a videotape prepared by Sevart. I would be grateful if you could review these at your earliest convenience and then give me a call so that we can discuss the matter further.

Very truly yours,

KECK, MAHIN & CATE

By: George Vernon

GV/mp

Enclosures

Humanscale 1/2/3 by Diffrient, Tilley & Bardagjy, 1974

U.S. Males:

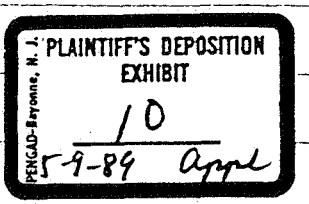
	Height	Weight
2.5 Percentile	63.6"	127.5 lb
50 Percentile	68.8"	172 lb
97.5 Percentile	74"	231.5 lb

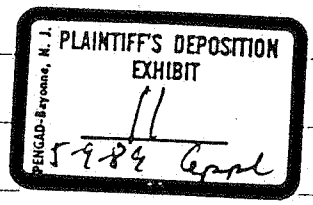
Dummies bought by Bush Hog

5% male	124 lb ± 10%
50% male	168 lb ± 10%
95% male	224 lb ± 10%

Woodson - Human Factors Handbook

5% male	124 lb
50% male	168 lb
95% male	224 lb





Subject Mower -
Bush Hog 105
Ser. 25983

5 Set wide
Side of deck 7" high
New Blades when inspected by Hull, 4-22-88

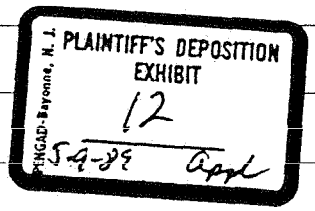
Tractor - Ford 8N

Ford 8N, 1952 Manual
1500 RPM recommended for PTO tools,
(Low gear - 2.77 mph)
1750 RPM recommended for use with no PTO tool
(Low gear - 3.23 mph)
Drawbar hp, 2nd gear (rated) 17.37 hp (75% of max)
Max hp = 23.16 hp
Max. belt hp 27.32 hp

No instruction in manual limiting use to operator only.

Klementovich vs Allied 1-23-89

Π riding as passenger on a Ford 8N tractor
Grandson driving tractor
Π sitting on fender
Π moves to miss a limb
Π falls off tractor
Tractor runs over Π
Bush Hog goes over Π



[illegible] vs Allied

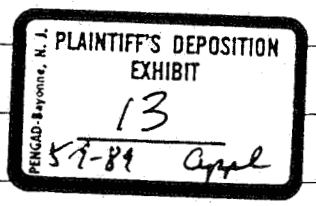
Depositions:

Ted Klementovich

Betty Klementovich

Justin Morales

John Servat



PAPER NO. MC 82-106

DESIGN AND DEVELOPMENT OF INTAKE GUARDS FOR AGRICULTURAL ROTARY MOWERS

by

Mr. J. B. Sevart, P.E.
President
Advance Technology, Inc.
Wichita, Kansas
Member - ASAE

Mr. Bradley Klausmeyer, EIT
Engineer
Advance Technology, Inc.
Wichita, Kansas

For presentation at the 1982 Mid-Central Meeting
American Society of Agricultural Engineers

St. Joseph, Missouri
March 19 & 20, 1982

SUMMARY:

This paper presents the results of extensive design research and development conducted to reduce the high risk of frontal opening blade contact associated with agricultural rotary mowers. Design theory, examples, test results and bibliography are included.

American Society of Agricultural Engineers
St. Joseph, Michigan 49085

Design Philosophy

Basic machine design philosophy includes the requirement of providing a reasonably safe design. The ethical Foundation for this requirement may be found in the Code of Ethics for Professional Engineers,") which states:

> "Engineers, in the fulfillment of their professional duties, shall hold paramount the safety, health and welfare of the public in the performance of their professional duties."

A tool used by design engineers to comply with this requirement is hazard-risk-utility analysis.

There is no need to introduce any complex mathematical analysis techniques or to develop a new vocabulary, understood only by a few specialists in a limited field of technology. In simple language, a hazard is some feature of a machine which has the propensity to cause injury to the human body. Typically, these are pinch points, weights, knives, beaters or other parts of the machine which are necessary for the machine to function and which during normal operation, have sufficient energy stored in them to produce injury.

Risk is a measure of the seriousness of the hazard and is a function of the frequency of occurrence and the potential severity of the resulting injury. If a given hazard produces numerous accidents but of minor severity, then the risk would riot be high. On the other hand, if the accident can cause death, then the risk is maximum for death is the ultimate **risk.**

Utility is simply a measure of how well the machine performs its intended function. It is an important aspect of machine design and must be considered at all phases of the design process, Features of a design

which unduly reduce utility may cause the design to be rejected by potential users. This requires the designer to make design trade-offs such that a reasonable balance is achieved; i.e., safety cannot be ignored in the interests of utility but on the other hand, utility cannot be ignored in the interests of safety.

The first step in making a hazard-risk-utility analysis is to review a proposed design for foreseeable hazards. This may be done by the use of human factors concepts such as comparing the available energy in the offending machine element with that required to cause injury.(2) It can also be accomplished by comparing the machine with similar machines including those used in unrelated industries (technology transfer), by reference to the available literature, and by considering patents. Not only must expected usage be considered but so must foreseeable misuse be considered,

The risk is then evaluated. This may be accomplished by the use of human factors; by the review of accident statistics (the head-count technique); and by reference to the available literature including that for similar machines and the medical profession. Unfortunately, past history indicates that engineers often must be told by the medical profession that excessive serious injuries are being inflicted on the operators, and bystanders, using a machine as exemplified by corn pickers and rotary mowers. To briefly digress, the medical profession was writing about "corn picker hand" in 1954,(3) and to date, industry has done nothing to significantly reduce the risk associated with the machine.

The first line of attack, once risk has been established to be significant, is to attempt to eliminate the hazard. Seldom can this be done and still maintain the function and utility of the machine. A knife that

would not cut human flesh would not cut much else. If the hazard cannot be eliminated then the designer should guard against the hazard to minimize the risk if not reduce it to zero. It should be noted that guarding can be accomplished in three different ways or by a combination thereof. Barrier guards, guarding by control, and guarding by location are well known concepts to be applied by the machine designer.(4),(5)

If the first two design strategies fail, then the minimum to be done is to adequately warn against the hazard. Considerable literature is available on *this* topic and will not be repeated in this paper.(6),(7),(8) Suffice it to say that general statements which are not specific to the danger level, action to be taken, and the consequences of not taking the required actions, are not adequate. Warnings which will never reach those exposed to the hazard cannot be expected to be very effective in reducing risk.

In rare occasions, it may not be possible to eliminate the hazard, guard against the hazard, or to adequately warn of the hazard. When this occurs the test becomes one of comparing the benefits of the product to society against the risk. For example, several chemicals and toys have failed this test and have been banned by government action. Unfortunately for the general public, and an embarrassment to thg engineering profession, many victims were required (more *of* the head-count syndrome) before the government took action.

In conclusion *of this* section, the procedure is quite straight forward. It must be applied in an unbiased, non-political, and knowledgeable manner to be successful but the rewards are significant both to society and to the

manufacturer. Injuries are the primary cause of products liability claims No injuries, No claims!

Design Philosophy Applied

In examining an agricultural rotary mower several hazards are apparent. The PTO drive line, the rotating blades, the propensity of the blades to throw objects from beneath the mower when struck, gear box couplings, and the weight of the machine in a raised position, all present a forseeable hazard to both operators of the equipment and to bystanders. In this paper, only the hazard associated with the rotating blade will be considered

Even if a single accident had not been recorded, it is foreseeable that an extremely high risk must be assigned to this hazard. It is well known that the smaller rotary mowers, powered by 3 Hp to 8 Hp engines, represent a significant, and unreasonable, risk as now marketed. With the increased available horsepower and blade weight, it is obvious that human contact with the blade of an agricultural rotary mower would result in tremendous physical injury and possibly death. Reported accidents do bear thts out.

Can the hazard be eliminated? The authors see no way at this time to produce a mower that can cut wrist-size sapplings and not cut arms, legs and torsos. If the risk of blade contact is to be reduced it must be done by guarding and this is the attack taken in the effort being reported.

Applying the three guarding concepts; i.e., barrier, control, and location, *the* authors considered location first. Limiting the problem to the intake, it was found that the tractor, hitch, and deck did not prevent potential blade contact at the intake. Testfng using a 95 percentile anthropomorphic dummy revealed that even with the three-point hitch mounted

units, the operator would contact the blade if pitched forward from the tractor. This is exactly what happens to the unrestrained operator when the tractor inadvertently strikes a physical barrier such as a hidden stump, rock, or ditch, all of which are foreseeable in the normal operating environment of the machinery.

For the operator, the only "safe" location would be on the tractor when the mower is being powered. As noted above, operators do not always leave the tractor of their own accord and further, it is foreseeable that contrary to safe practice, riders or bystanders may be present. While possible to provide seat belts on the tractor or to provide a "deadman" device with the tractor, this is not universally done by tractor manufacturers.* Further, the manufacturers of agricultural rotary mowers have no control over the tractor to be used or of the conduct of the operator. It was concluded by the authors that the hazard was not and could not be considered "guarded by location".

Guarding by control would be exemplified by some type of deadman device on the tractor. This concept was suggested many years ago by the Dooley Patent[9] but has riot been adopted by any tractor manufacturer. Independent of the correctness of this decision by tractor manufacturers, it is beyond the control of most manufacturers of agricultural rotary mowers, It should be recognized that even the deadman concept would not protect riders or bystanders from the hazard.

With this background, the authors concluded that a barrier guard would be the **only** concept **which would** reduce the risk of blade contact any significant amount **and be** within the control of the mower manufacturer.

*The reader should not construe this statement to mean that the authors agree with **this** practice, It **is** absolutely **professionally** inexcusable for a manufacturer of a tractor **not** to **provide** ROPS and a seat belt and **this has** been true for many years.

Design Criteria

The following criteria were developed by the authors for a barrier guard to be used on an agricultural rotary mower:

1. Must not unduly interfere with the admittance of the material to be cut. (Plugging)
2. Must prevent significant blade contact for a wide spectrum of humans, riot 1iniited solely to foreseeable operators.
3. Must not unduly reduce the quality of cut with respect to that of the unguarded mowers. (Skipping)
4. Must be durable.
5. Must be adjustable.
6. Must riot add significant cost to the machine.
7. Must accept a wide range of vegetation to be cut.
8. Should look "a part" of the mower.
9. Would be beneficial if automatically adjustable with cutting height but not mandatory.
10. Would be desirable if the guard were to offer a secondary benefit of protecting the machine such as by preventing the entry of rocks or overly large sticks into the mower.

A possible criteria not listed was the inclusion of a mechanical interlock as a part of the frontal guard which would prevent blade rotation with the guard removed. The manufacturer who has concern that the guard might be removed should consider that concept. The authors plan to develop such a device as .part of the continuing design research associated with the safety of agricultural rotary mowers. However, testing to date has not indicated that there would be motivation to remove the guard and the guard does offer protection to the machine as we71 as to humans,

On a production basis, a note should be placed *in* the owner's manual explaining the importance of the guard and warning against removal. A similar warning should be placed on the mower deck. (Not on the guard as the warning is gone when the guard is removed.)

Example No. 1

The first unit so equipped was a five (5) foot pull-type agricultural rotary mower. This design is shown in figure 1. The unit was fabricated of mild steel tubing and was adjustable by manually raising or lowering the guard with respect to brackets attached to the front of the mower deck. The design was expanded to fit a seven (7) foot pull-type unit of the same manufacturer but this unit did not receive extensive testing.

The basic design selected was that of a comb guard and was found in a brief patent search for rotary lawn mowers.[10],[11] The spading of the teeth of the comb was set by reference to anthropometric tables.[12],[13] and tables for opening size vs. distance to the hazard point,[14] The guard was then tested on various types of grass and weeds. It was found that when mowing bind weed the vegetation would attempt to collect at the juncture of the comb teeth and upper support tube. By experimentation it was discovered that this problem was totally eliminated by placing a length of 1/2 inch steel reinforcing bar horizontally across the comb teeth as shown in Figure 1.

Extensive tests were conducted on the unit including the mowing of weeds, Johnson grass, pasture with hedge regrowth up to an inch and a half in diameter, dried grass and various types of normal grasses. Pasture land, which was rough and contained rocks and small stumps, was mowed without damage to the guard. The guard performed well under all these mowing conditions and never had to be repaired.

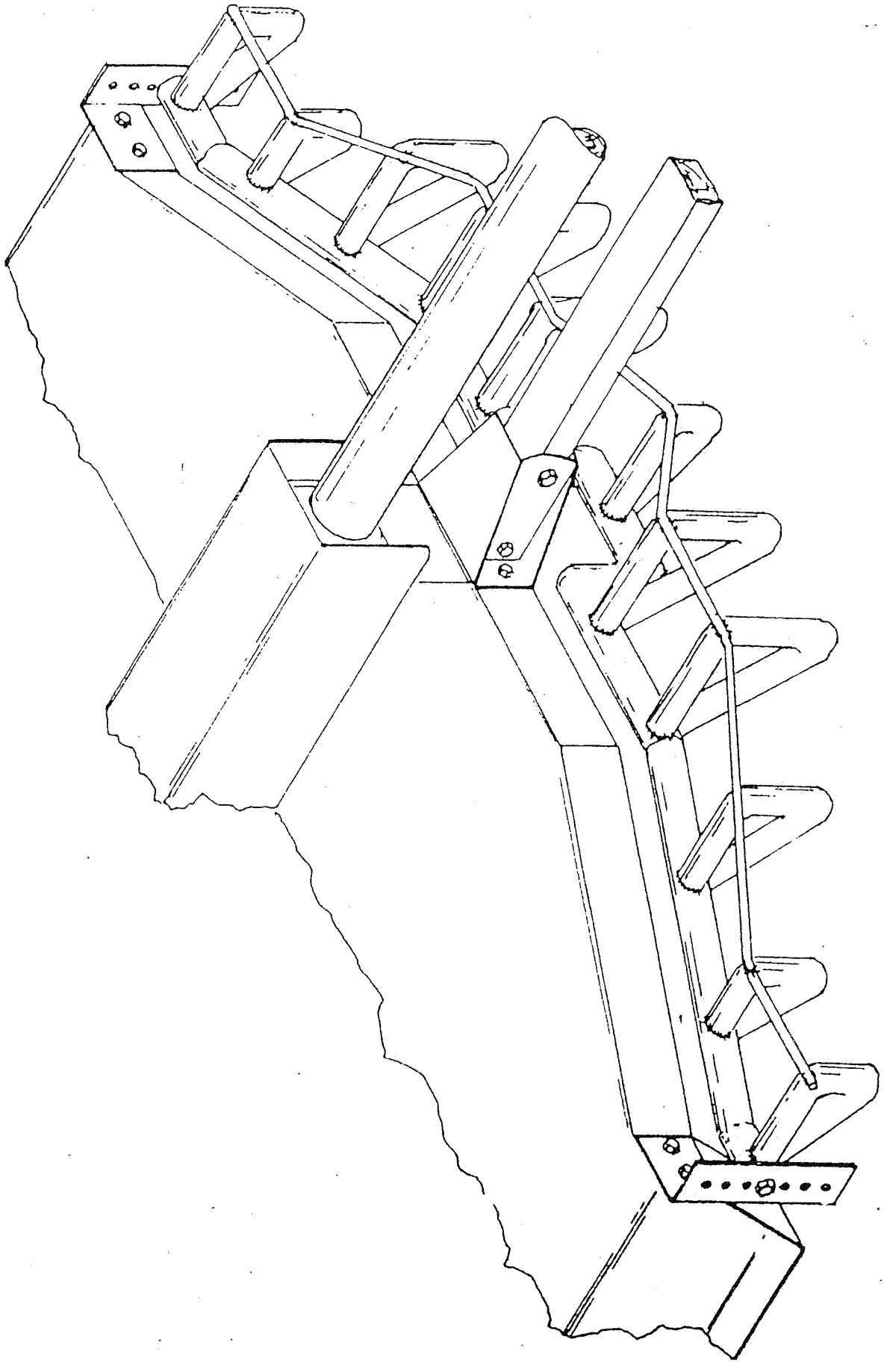


FIGURE 1

To evaluate the guarding effectiveness of the guard, a 95 percentile anthropomorphic dummy was dropped from the back of the tractor into the path of the mower and was also laid on the ground so that the tractor could straddle the dummy. In no test was the dummy injured, The guard tended to work the dummy to one side or the other until it rolled free of the mower.

The estimated manufacturing cost of this unit in lots of five-hundred (1982 dollars) is $36.34. The unit had no adverse effect on quality of cut, did not clog, was durable, could function in a wide range of vegetation, was adjustable, and did offer the desired protection. It was the opinion of the authors that the device was an acceptable design and that the concept was proven to be a desirable one.

Example No. 2

The second unit selected was of the three-point hitch type. This mower also had a five (5) foot cut but was closer to the rear tires of the tractor than were the towed units. The design is shown in Figure 2. Fabrication and design is quite similar to the first example, Figure 3 illustrates this design using an autoniatic adjusting feature. This concept has not yet been fabricated or tested but will be in the near future.

Tests on this unit have been limited with extensive testing planned for next summer and fall. However, the testing completed to date indicates that the unit performs much like the first example did. The estimated manufacturing cost in 1982 dollars is $45.16 (for a lot size of 500 units.)

Conclusions

The authors have found the risk associated with the frontal opening of agricultural rotary mowers to be extremely high. Because design alternatives do exist which are technically and economfcally feasible and do not adversely

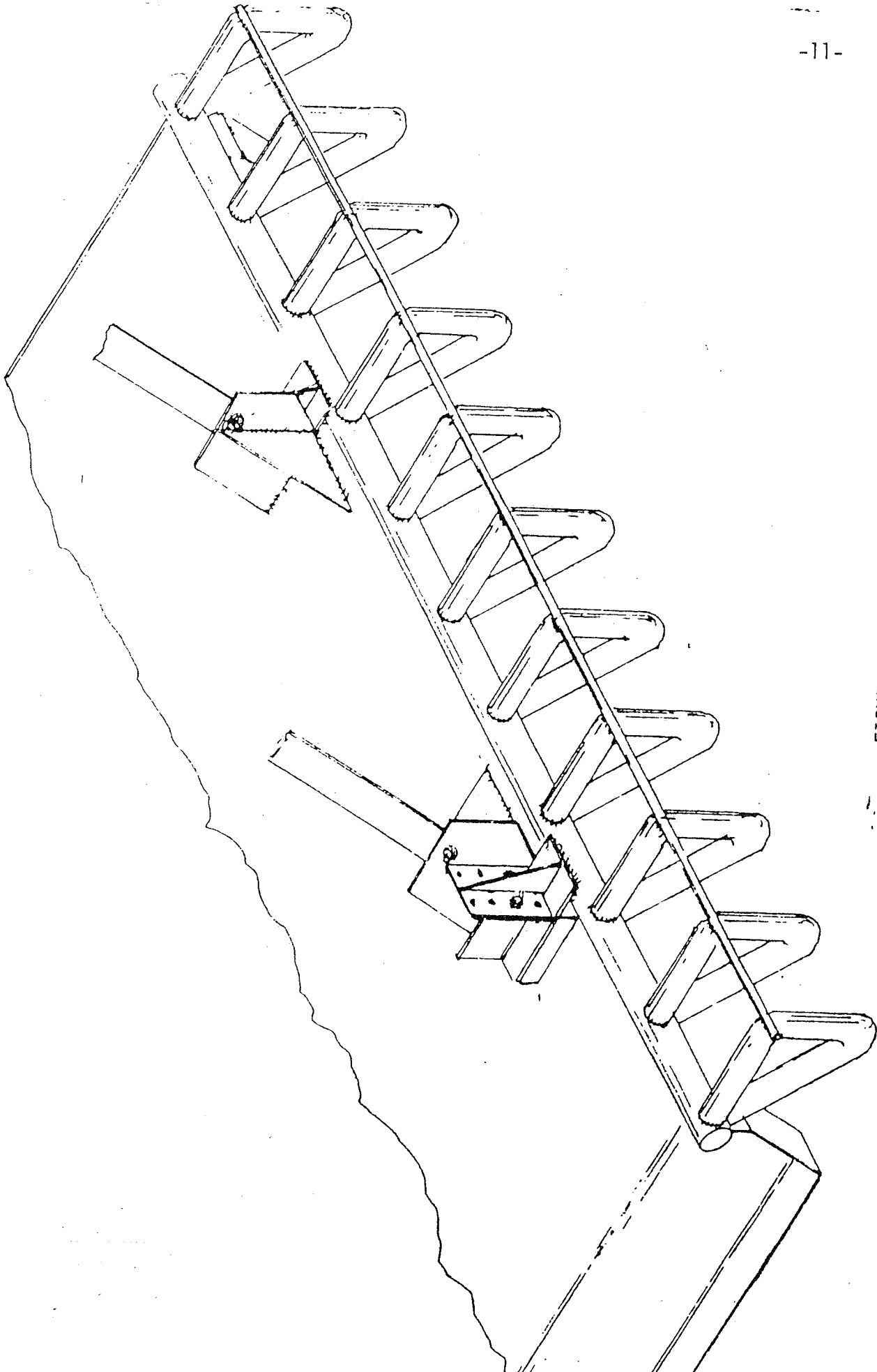


FIGURE 2

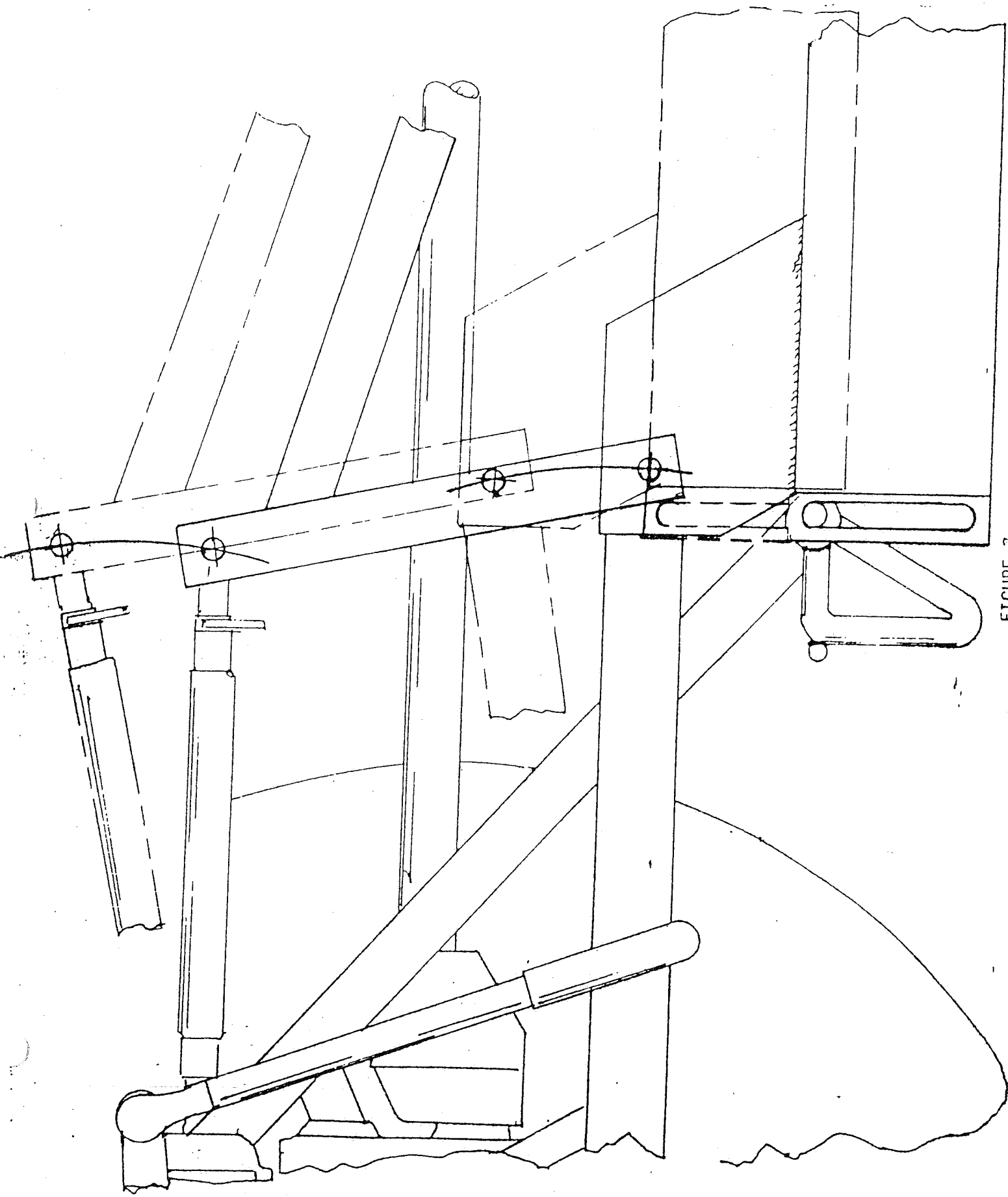


FIGURE 3

affect the utility of the machine, the unguarded intake renders the design unreasonably dangerous and thus defective, Proof of the excessive risk is the number of serious injuries and deaths that have resulted from the use of agricultural rotary mowers,

In the opinion of the authors, the comb guard is one design alternative that can be effective in significantly reducing the risk associated with agricultural rotary mowers without any great reduction in utility. It is sincerely hoped that manufacturers will incorporate this guard, or some similar device, to prevent the injuries and deaths that now occur.

REFERENCES

1. "Code of Ethics for Engineers", National Society of Professional Engineers, Publication No. 1102, January, 1981,

2. Sevart, J.B., P.E., "The Use of Human Factors During the Design Stage to Predict Product Hazard", MCR-80-705, American Society of Agricultural Engineers, St. Joseph, Michigan, 1980.

3. Maxim, Edward, M.D., et al, "The Cornpicker Hand", The Journal of Bone and Joint Surgery, 1954.

4. "Industrial Safety", edited by Roland P. Blake, Prentice-Hall, Inc., 1943,

5. Buchele, Wesley F., "The 1970's: The Decade of the Guard", Journal Paper No. 5-9957 of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa, Project No. 2343, 1980.

6. "Specification for Accident Prevention Signs", ANSI 235.1 - 1972, American National Standards Institute, Inc., New York, New York.

7. "John Deere Design Data - Safety, Instructional, and Miscellaneous Signs and Standard Letters and Numbers", John Deere Company, Moline, Illinois, 1970.

8. Ross, Kenneth, "Legal and Practical Considerations for the Creation of Warning Labels and Instruction Books", Journal of Products Liability, Vol. 4, No. 1, 1981, Pergamon Fress.

9. Dooley, C.H., "Tractor Safety Control", U.S. Patent 2,250,754, July 29, 1941, United States Patent Office.

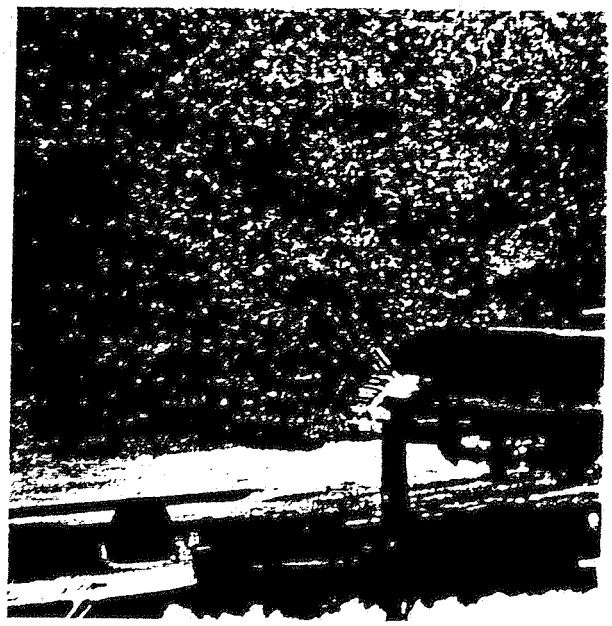
10. Phelps, W.H., "Guard for Power Mowing Machines", Patent No. 2,511,124, June 13, 1950, United States Patent Office.

11. Ridenour, et al, "Power Lawn Mower with Guard Attachment", Patent No. 2,972,849, February 28, 1961, United States Patent Office.

12. "USA Human Physical Dimensions", SAE 5833, Society of Automotive Engineers, Inc., Warrendale, Pennsylvania, 1980.

13. "Anthropometry of U.S. Infants and Children", SAE SP-394, Society of Automotive Engineers, Inc., Warrendale, Pennsylvania, 1975.

14. "Handbook of Occupational Safety and Health", National Safety Council, Chicago, Illinois, Page 148, 1979.



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KLEMENTOVICH V. BUSH HOG

DEPOSITION OF FRANKLIN J. APPL (May 9, 1989)

PAGE	LINE	
3	17	The witness is a consulting engineer and president of Appl Engineering Company.
9	22	He has a video tape of tests that he conducted at Bush Hog.
10	19	He has never seen a film with screaming and hollering.
14	10	He tested a Bush Hog guard with the guard adjusted down to the ground.
14	15	The tractor speed was two mph.
14	23	In one out of sixteen tests, the guard prevented any extremity of the dummy from going under the mower deck.
14	25	In the other 15 tests, at least one limb of the dummy went under the deck of the mower.
18	8	He tested the guard on a mower mounted to a three point hitch. When the back wheel rolls over the dummy, the mower deck raises up.
21	11	Lengthening the hitching distance between the three point hitch and the tractor would probably defeat the action of the three point hitch.
23	9	If extending the distance between the tractor and mower and adding a guard would prevent the dummy from going under the deck and yet maintain the utility of the product, then the guard would be a good thing to have.
24	14	The test guard was adjustable. It could be moved up and down relative to the skid of the mower.
25	1	The witness tested the utility of the guard.
26	15	The mower was tested by mowing wild plum bushes. They were 6-8' tall.
33	19	During the test that the witness conducted, the rear wheel always ran over the dummy.
34	14	When the guard was set at ground level, it scrapes up and collects material and stops the tractor.
35	11	The guard was not positioned down with the mower skid raised. The tests were conducted with the skids at ground level.
35	21	The witness did not feel such a test was necessary because the guard was clogging up and the mower was not.