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Forensic Investigation of Tilting File Cabinets

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Abstract

This case involved a file clerk inserting files into an office 4 drawer file cabinet. The file cabinet did not have latching devices for the drawers. The file drawers were designed to be stabilized with a small indent in the suspension track to prevent the drawers from unexpectedly opening. The file cabinet unexpectedly tilted and opened all the drawers with a force sufficient to knock the clerk to the floor with the file cabinet on her back. The clerk sustained substantial back injuries.

The jury agreed with the forensic engineering analysis and were shocked at the ease of the drawers opening, the cabinet falling, and the force of overturning of the file cabinet. The jury awarded the verdict to the plaintiff with a surprising twist.

Investigation

Logical engineering judgements for the cabinet tipping calculations would be that the cabinet was level and plumb while in the office. The base would be firmly set on a stable floor. Any tipping would occur about the front lower edge of the cabinet.

During the investigation the force to make the drawers move out of the safety indent was measured at 6 pounds horizontal. This calculated to a COF of 0.08 or the slipperiness of wet ice. The force to move the fully loaded drawer while level was very slight, due to the superb mechanism to reduce friction on the suspension system. If the rear of the cabinet was raised 3/8 of an inch, the drawers would jump the indent and roll out, even if fully loaded. Once the drawer was out of the indent and moving, the deformation of the cabinet would add the drawer's propensity to accelerate. This movement would be followed very quickly by the other drawers jumping their indent and quickly opening and probably overturning the entire cabinet. This action can only be stopped if the person was aware and ready to react to the overturning cabinet.

With a plush carpet and pad, the rotation point (See Figure 1) will be rearward of the front edge of the cabinet. This will be evident as the maximum support available from the carpet and pad have been exceeded. The same effect can be caused by having a tack strip under the rear of the cabinet and/or the floor out of level.

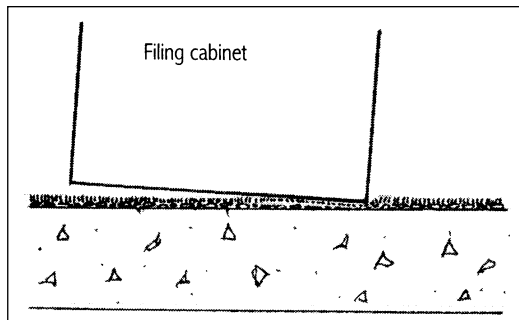


Figure 1

The crushing of the carpet and pad can cause the rotation point to move to the left and thereby making the cabinet even more unstable. An out of level condition of approximately 3/8 to 1/2 inch will cause the drawers to jump their indents and violently open.

To determine the amount of tip necessary to be critical for jumping the indent on a hard floor, a wood wedge was used. The amount required under the rear of the cabinet, on a hard floor, was only 3/8 inch. This was surprising and very disturbing. If the floor had a plush carpet, out of level floor, or a tack strip along the back of the cabinet, the cabinet could easily be very near critical drawer instability and any movement or vibration could cause all the drawers to suddenly and violently jump their indents and open as the cabinet falls forward.

Trial Testimony

The new conditions and revised loading estimates of the drawers during trial testimony, provided a filing cabinet that was stable with a significant safety factor against tipping. The trial description of the action by the plaintiff was that the top two drawers were full and tight, necessitating removing a file to place another file in its place. The top drawer was out approximately 1 inch, the second drawer was out approximately 12 inches (23 inches was full extension). The bottom two drawers were closed and fully loaded.

These new facts as presented to engineer Yaxley, after the plaintiff's testimony were as follows:

1. All drawers were fully loaded.
(75.75 lbs rather than the 46 pounds required by ANSI tests)
2. The top drawer was opened 1 inches.
(Not 2-1/2 inches as initially stated)
3. The second drawer was opened 12 inches.
(Rather than the 18 inches initially stated)

4. The bottom drawers were loaded and fully closed.
(Rather than mostly empty)

This scenario was significantly different than the facts presented prior to the trial that formed the basis of my testimony. The filing cabinet, as described by the plaintiff during her trial testimony, was fully loaded, a complete surprise to engineer Yaxley. The cabinet was stable and had a significant factor of safety against overturning. The defense brought the cabinet to the court room and had each drawer fully loaded with reams of paper rather than files, a significantly higher load. Any engineering calculation would quickly conclude the cabinet could not tip as stated by the plaintiff.

Court Testimony

Q. Mr. Yaxley, how long have you been in Houston?

A. Two days.

Q. Where have you been during the trial testimony?

A. Out in the hall on the hard benches.

Q. Why didn't you come in and listen to the testimony?

A. I didn't think I would be allowed in the courtroom.

Q. Did anyone tell you that you could not be present?

A. No- - - -but usually - - - -!! Only if the rule has been invoked.

Another minor hard lesson about the rule being invoked against the expert being in the courtroom. Of course if I had been in the courtroom, they would have quickly invoked the rule and made me stay in the hall on the hard benches. **DO NOT MAKE UNVERIFIED ENGINEERING JUDGEMENTS.**

On to the actual trial testimony! The defense, on cross examination asked me to demonstrate how this cabinet could fall over with the facts as listed on the blackboard from the testimony of the plaintiff during her testimony. I reluctantly, walked slowly over to the file cabinet, knowing it could not fall over. I calmly recounted from the list left by the plaintiff that she had pulled a file from the 2nd drawer, I pulled a file from the 2nd drawer and laid it on the table. I picked up the new file from the table and placed it into the place vacated by the first file. **NO TIP OVER!** I slowly removed a second file from the 2nd drawer, and laid it on the table. I picked up the new file from the table and placed it into the place vacated by the second file. **AGAIN NO TIP OVER!** I slowly removed the third file from the 2nd drawer and laid it on the table. Again I replaced it with a new file, as defined by the Plaintiff during her testimony. Suddenly, without warning the whole file cabinet tipped and all the other drawers violently slid out, and the file cabinet was headed to the floor of the courtroom. I was

afraid to let it fall, since we were on the 5 floor in an older building and I wasn't sure if the floor would hold that sudden shock load. I struggled to upright the cabinet to prevent injury or damage; but, during the melee I ripped a hole in my suit sleeve and slightly cut my arm with the side of the cabinet. As you can imagine, the jury all stood up and gasped at the sudden tipping of the file cabinet and the force generated by all those loaded drawers suddenly opening. The defense quickly yelled, "I OBJECT!! I OBJECT!!" The judge said, "To what, that was your instruction, to demonstrate how the file cabinet fell!" The defense insisted on setting up the file cabinet again and, over my objections, made me do it all over again. Of course with the same result the file cabinet fell over when the third file was being inserted into the second drawer.

Conclusion

With all the conflicting statements by the plaintiff, I still did what she, and many other innocent file clerks do, place files in overloaded and tight file drawers. In forcing the files into the drawer it is easy to unknowingly further open the drawer, thereby making the lever arm longer and thereby requiring less downward force to cause the cabinet to tip. With the other drawers latched with a thumb latch, this accident would not have occurred. With file cabinets that do not have thumb latches, these overturning conditions can easily be present.

Verdict

The jury was fascinated with the demonstration and awarded the verdict to the plaintiff. The changing testimony by the plaintiff led the jury to not believe her injuries. The defense presented over 500 pages of hospital records confirming she had many back related incidents that she first denied until presented with the records in court. The lies she was caught in made the jury decide on a plaintiff's verdict with zero dollars awarded.