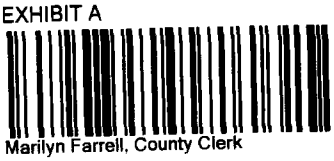
EXHIBIT A



Marilyn Farrell, County Clerk

EF2018-8
12/16/2022 03:34:45 PM

Clerk: LAR

Exhibit A

Roger N. Wright, LLC

CONSULTING & TECHNICAL SERVICE
METALLURGY & METALS PROCESSING
RNWINC.COM

600 STATE STREET
LAWRENCEVILLE, IL 62439-3060
PHONE: 618-943-1029
E-MAIL: wrightinc@earthlink.net

April 13, 2020

Remarks Regarding Alfeld vs. Apex Tool Group, LLC, et al.

In Supreme Court, State of New York, County of Greene, Thomas Alfeld and Bethany Alfeld are Plaintiffs against Apex Tool Group, LLC and Home Depot USA, Inc., Defendants in a matter involving an eye injury sustained by Thomas Alfeld while using a newly purchased tool manufactured by Apex Tool Group and sold by Home Depot. It is the purpose of this memorandum to summarize technical aspects of this incident.

The clipper tool employed by Mr. Alfeld is commonly sold by Home Depot, under the brand name CRESCENT, as part of a two-tool set, with the tool involved in this litigation being labelled as a "wire cutter", and the other tool being labelled as a "mini plier".

Thomas Alfeld, a professional carpenter, was attempting to clip off a steel pin nail protruding from a wood component of a stair assembly, when one of the blades of the clippers broke off and hit him in the eye, resulting in substantial injury.

The wire cutter used by Thomas Alfeld was entirely inappropriate for this specific operation, and this should have been obvious to a professional with his background. Moreover, Mr. Alfeld failed to take rudimentary safety measures, including failure to wear safety glasses. Major bases for these criticisms can be summarized as follows.

a) The "low profile flush cut wire cutter" used by Mr. Alfeld was designed for use in cutting soft electrical wire, generally annealed copper or aluminum. (This soft, annealed condition is required for maximum electrical conductivity.) On the other hand, the strength or robustness of this cutter is inadequate for the cutting of hard steel pin nails, and there is a high risk of tool fractures and related injuries of the type involved with this litigation.

i) To quantify this point, it can be noted that the maximum force in pounds, F_{max}, necessary for the shearing of round wire, can be estimated with the formula $F_{max} = (0.55)\ (UTS)\ D^2$, with D being the wire diameter in inches, and UTS being the wire ultimate tensile strength in pounds per square inch.

ii) So, considering a typical 20 AWG copper electrical conductor, in the soft, annealed condition, with a UTS value of 32,000 pounds per square inch and a diameter of 0.032 inches, one can estimate a maximum shearing force of about 18 pounds.

iii) Electrical conductor aluminum wire may be cited in a similar fashion, with a UTS value of 13,000 pounds per square inch and a diameter 0.032 inches, leading to an even lower (softer) estimated maximum shearing force of about 7 pounds.

iv) And, considering a typical carbon steel pin nail wire, with a UTS value of 170,000 pounds per square inch and a diameter of 0.026 inches, one can estimate a maximum shearing force of about 63 pounds.

b) Thus, the steel pin nail would require about half-an-order-of-magnitude greater force for its shearing, in comparison to the shearing of copper conductor. Hence, a pliers designed for simply shearing electrical conductor copper may well be extended beyond its strength and safety limit when applied to the shearing of a carbon steel pin nail. Certainly this is the opinion of the manufacturer, who provides the guidance in item c), below.

c) In regard to point a), the manufacturer of this tool cites the following on the tools and their packaging:

i) "Cuts soft wire up to 20 AWG (0.8 mm)";

ii) "WEAR SAFETY GLASSES";

iii) "PROTECT YOUR EYES";

iv) "...miniature electronic flush cutter....".

(As an aside, it may be noted that the AWG citation stands for "American Wire Gage", and "20 AWG" indicates wire of a diameter of 0.032 inches, which is equivalent to 0.81 mm. And, it should be noted that higher gage numbers are associated with smaller diameter wire. For example, AWG 21 gage wire would have a diameter of 0.028 inches, as opposed to 0.032 inches for AWG 20.)

Also, the AWG gaging system is commonly used for copper and aluminum electrical wire specifications. In comparison, steel pin nails are often of Steel Wire Gage 23, indicating a diameter of 0.026 inches, which is equivalent to 0.66 mm, and the plaintiff has testified that the diameter of the pin nail involved in this litigation was, in fact, Steel Wire Gage 23.

It might be argued that clippers that are designed for 0.032 inch diameter copper or aluminum wire could be applied to a steel pin nail of, say, a smaller, 0.026 inches diameter. However, consistent with the above illustrative calculation, copper and aluminum electrical wires are generally much softer than steel nail wire, and the steel nail wire can impose a much higher force on the clippers, leading to fracture and personal injury. That is why the limitations and safety measures are prominently set forth on the clipper packaging.

In any case, the disregard for risks and safety measures is the dominant engineering issue in this litigation.

The foregoing arguments are my opinion, within the bounds of a reasonable degree of engineering certainty.

Roger N. Wright

Roger N. Wright, Sc.D., P.E.