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(54) **HEADLIGHT LENS RESURFACING
APPARATUS AND METHOD**

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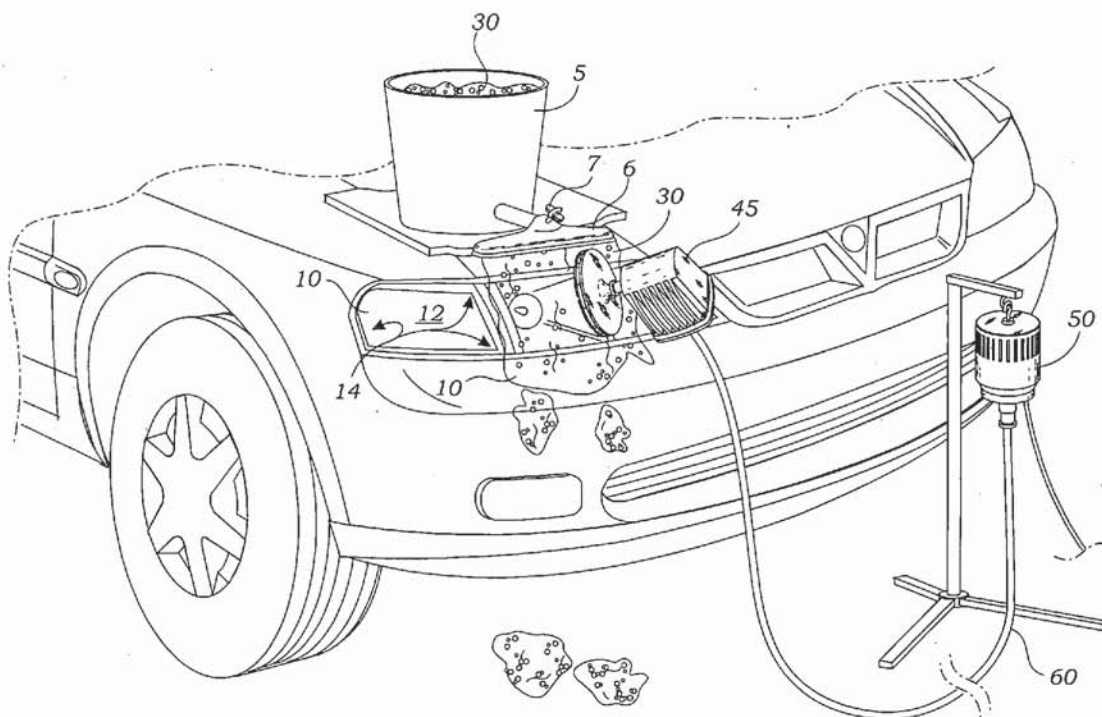
(57) **ABSTRACT**

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Refinishing an exterior automotive lens having a damaged exterior surface in situ using a continuous movement and oscillating motion, with first, a 320 grit sanding disc, next a 600 grit sanding disc and finally a 1500 grit sanding pad while flushing the surface with water to prevent melting of the surface. Buffing the surface with a polishing compound until a high gloss is achieved. Finally, coating the surface with a transparent ultraviolet hardenable coating material, and hardening it by exposure to an ultraviolet light source. This method is accomplished using an oscillating tool having a remotely located drive.

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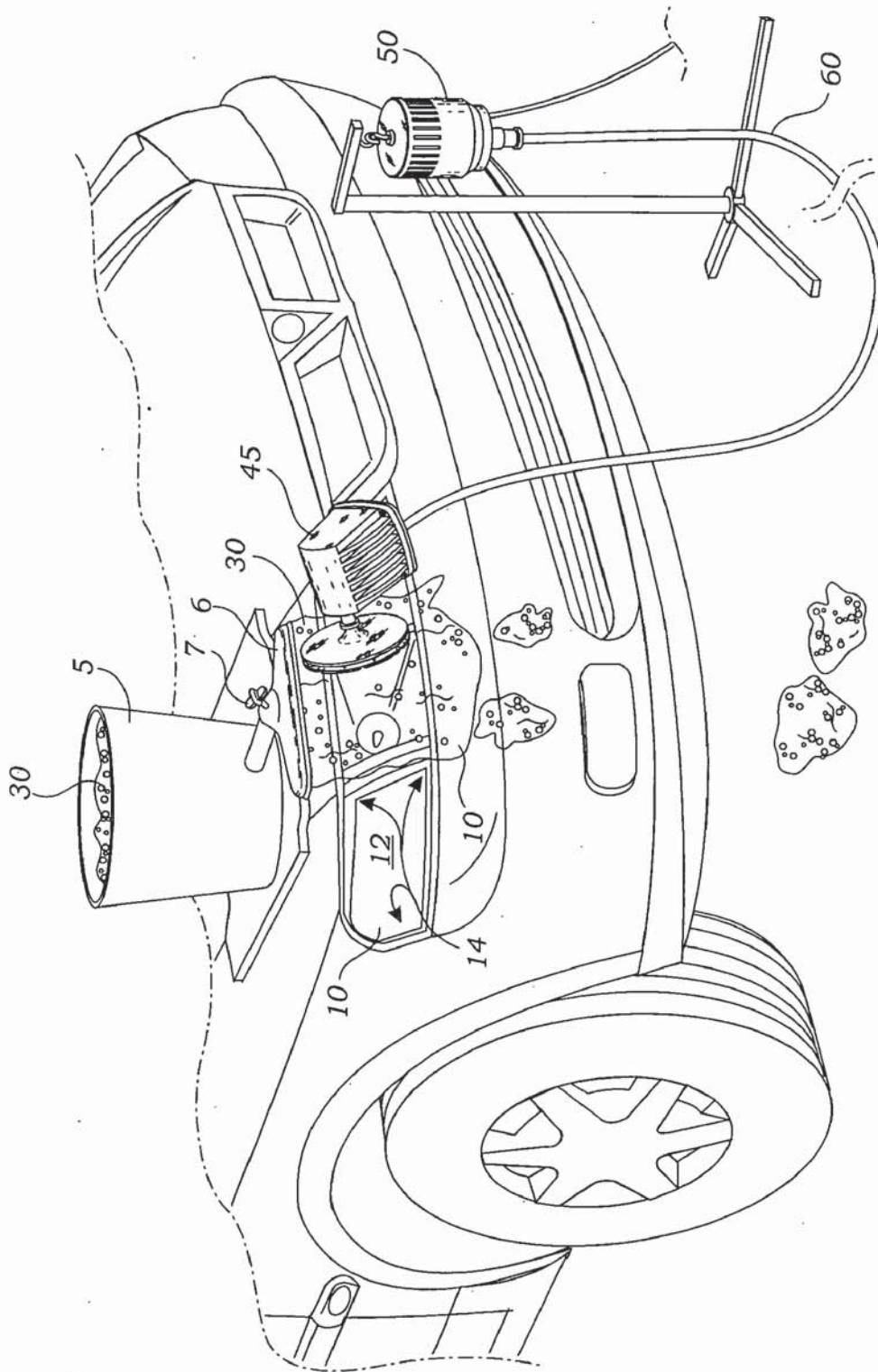


Fig. 1

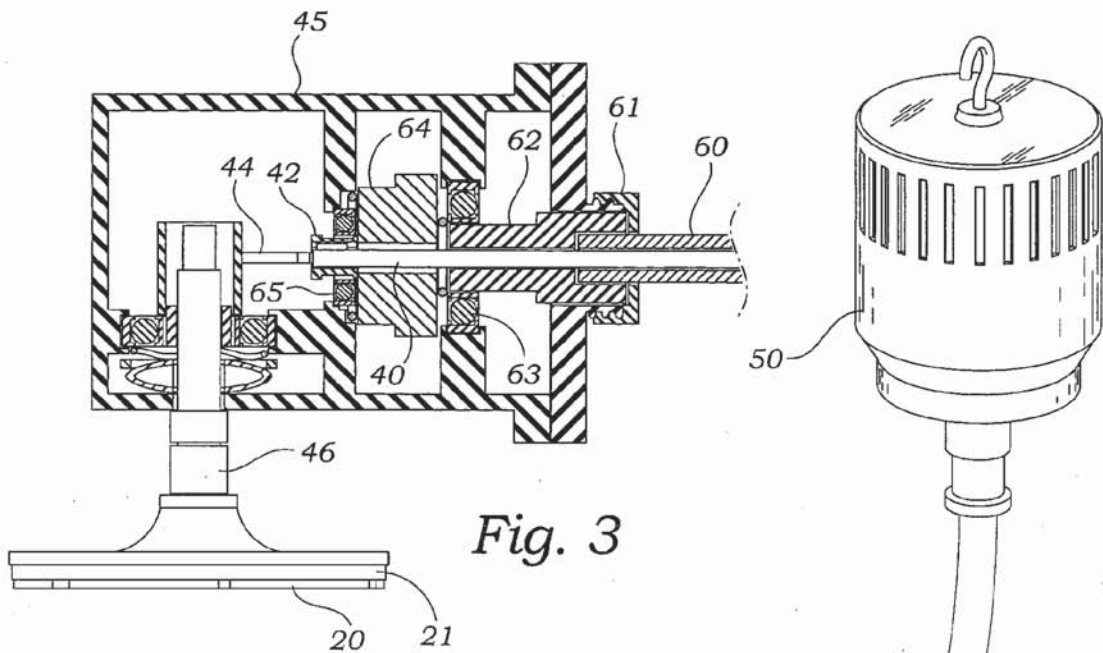


Fig. 3

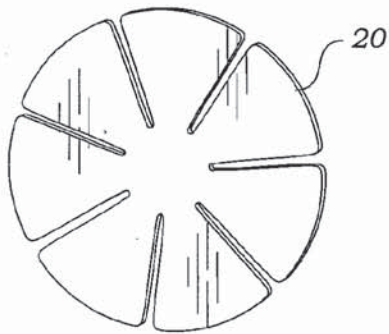


Fig. 4

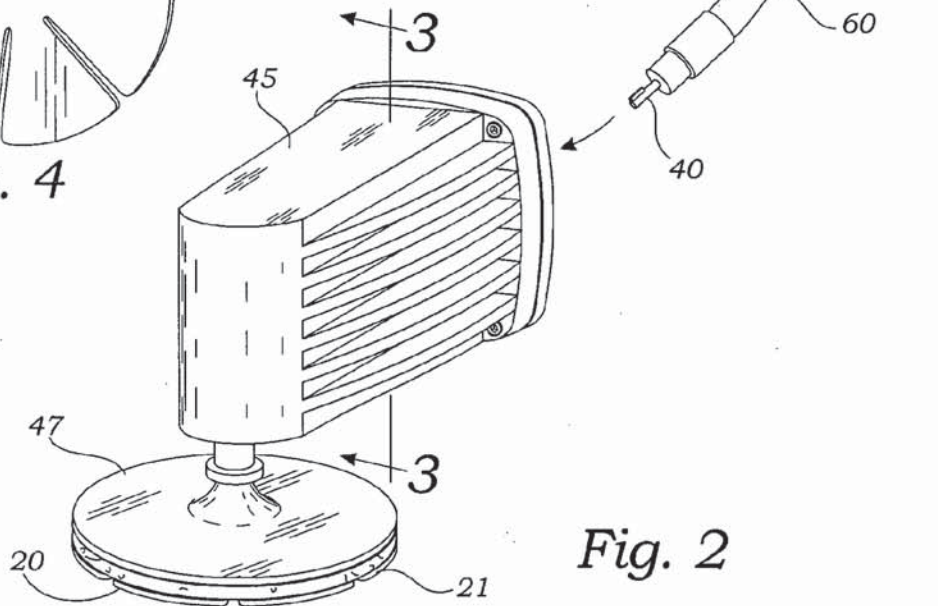


Fig. 2

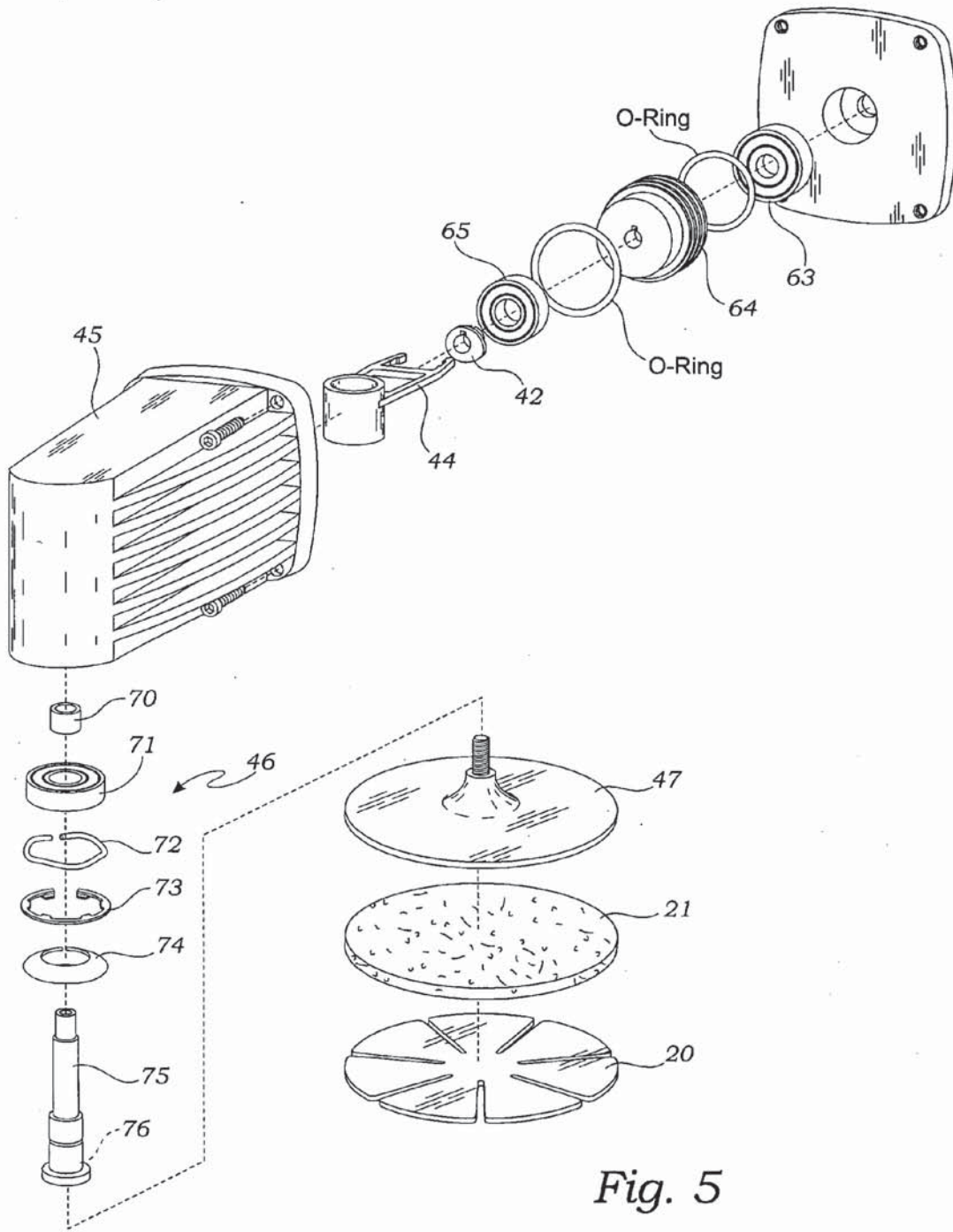


Fig. 5

HEADLIGHT LENS RESURFACING APPARATUS AND METHOD

BACKGROUND OF THE INVENTION

Incorporation by Reference

[0001] Applicant(s) hereby incorporate herein by reference, any and all U.S. patents and U.S. patent applications cited or referred to in this application.

Field of the Invention

[0002] This invention relates generally to resurfacing of transparent plastic surfaces due to wear and crazing, and more particular to a specific apparatus singly adapted for such resurfacing and a method of using the apparatus.

Description of Related Art

[0003] The following art defines the present state of this field:

[0004] Coburn, et al., U.S. Pat. No. 5,027,560 teaches a machine for finishing the surface of a lens including a lap holder moved orbitally in a first plane, a lens arm support having a lens holder, the lens arm support being oscillated in a second plane perpendicular to the first plane, the lens arm holder being also simultaneously oscillated in a third plane perpendicular to the first plane, the lens holder being urged toward the lap holder.

[0005] Sherwin, U.S. Pat. No. 4,510,717 teaches an apparatus for finishing or polishing a surface of a lens with a finishing tool. The apparatus includes a main frame, a shaft pivotally mounted to the main frame, and eccentric drive means driving the shaft in a predetermined orbital motion. Lens finishing means are fixedly secured to one end of the shaft. A lens carrier is slidably mounted to the main frame such as to be reciprocable along a path perpendicular to the orbital axis of the shaft. The lens is removably mounted to the carrier and is biased by a biasing device against the lens finishing tool.

[0006] Gulati, et al. U.S. Pat. No. 4,287,018 teaches a method and apparatus for edge-grinding stressed laminated glass-plastic lens blanks wherein the lens blanks are heated during the abrasive edging process to reduce thermal stress breakage. The edged lenses are optionally etched to remove glass flaws, thus providing laminated lenses exhibiting improved resistance to thermal stress breakage in use.

[0007] Our prior art search with abstracts described above teaches: a machine for finishing the surface of a lens, a lens finishing apparatus, and a method for finishing glass-plastic laminated lens blanks, but does not teach a machine for refinishing a damage lens surface using oscillating motion with a power drive remote with respect to an oscillating head and does not teach the present method of removal of the outer surface of the lens. The present invention fulfills these needs and provides further related advantages as described in the following summary.

SUMMARY OF THE INVENTION

[0008] The present invention teaches certain benefits in

[0009] Automobile headlamp lenses are generally fabricated by injection molding of engineering plastics such as polycarbonate. The General Electric Company sells polycarbonate resin under the well known name; Lexan®. Such lenses are quite clear, tough and chemical resistant, but suffer from surface crazing due to scratches that cause them to become cloudy over time, primarily through normal mechanical abrasion in use. The conventional remedy, when the lens becomes so cloudy that headlamp light is dangerously reduced, is to replace the lens. However, this is expensive because of the cost of new lenses and also because of the high hourly pay rate for mechanics that remove the worn lenses and replace them with new ones.

[0010] The present invention teaches an alternative to replacement that is more cost effective, in that it does not require removal of worn lenses nor mounting of new ones. Thus, this approach saves both the cost of new lenses as well as the cost of labor for replacement. The present invention teaches an apparatus that is ideally suited to removing the outer damaged surface of on an existing lens and a method for doing so. Therefore, the present invention method removes the abraded surface on a lens while it is still mounted on the vehicle, and restores optical clarity and light output to the level of new lenses.

[0011] The present invention teaches the refinishing of an exterior automotive lens having a damaged exterior surface in situ using a continuous movement and oscillating motion, with first, a 320 grit sanding disc, next a 600 grit sanding disc and finally a 1500 grit sanding disc while flushing the surface with water to prevent melting of the surface. This is followed by buffing the surface with a polishing compound until a high gloss is achieved. Finally, the surface is coating with a transparent ultraviolet hardenable coating material, which is then hardened by exposure to an ultraviolet light source. This method is accomplished using an oscillating tool having a remotely located drive so as to avoid mixing an electric drive with the water used for flushing the operation.

[0012] A primary objective of the present invention is to provide an apparatus and method of use of such apparatus that yields advantages not taught by the prior art.

[0013] Another objective is to provide such an invention capable of removing damage surfaces on automobile headlight lenses.

[0014] A further objective is to provide such an invention capable of being used in a water flooded surface refinishing operation without fear of electric shock.

[0015] Other features and advantages of the present invention will become apparent from the following more detailed description, taken in conjunction with the accompanying drawings, which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The accompanying drawings illustrate the present invention. In such drawings:

[0017] FIG. 1 is a perspective view of the invention showing its method of use;

[0018] FIG. 2 is a perspective view of a lens carrier

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