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(54) **VEHICLE HEADLIGHT RESTORATION**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(57) **ABSTRACT**

(52) **U.S. Cl.** **451/54**; 451/41; 451/42;
451/57; 510/163

(58) **Field of Classification Search** 451/54,
451/41, 42, 57, 921; 510/163, 243
See application file for complete search history.

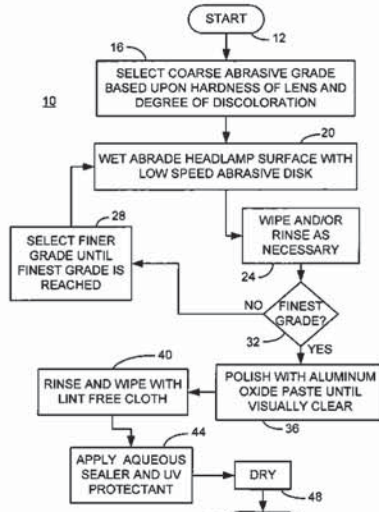
A method of restoring a discolored automobile headlight lens without removal of the lens from the automobile consistent with certain embodiments involves wet abrading an outer surface of the lens with successively finer grit wet sanding disks, using a low speed rotary or orbital tool having a flexible sanding holder holding the sanding disks, until a smooth surface is achieved exhibiting no discoloration, wherein the wet sanding disks comprise disks starting from approximately 220 to 400 grade down to approximately 2000 grade; polishing the outer surface of the lens with an aqueous paste abrasive polish containing aluminum oxide abrasive particles; cleaning any residue from the outer surface of the lens by wiping the lens with a lint free cloth; and spraying a film forming aqueous polymer dispersion containing an ultraviolet protectant to the outer surface of the lens, wherein the sealer comprises of acrylic urethane copolymers, Hindered Amine Light Stabilizers, benzotriazole UV light absorbers, 1-methyl-2-pyrrolidone, and dipropylene glycol monomethyl ether. This abstract is not to be considered limiting, since other embodiments may deviate from the features described in this abstract.

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14 Claims, 2 Drawing Sheets



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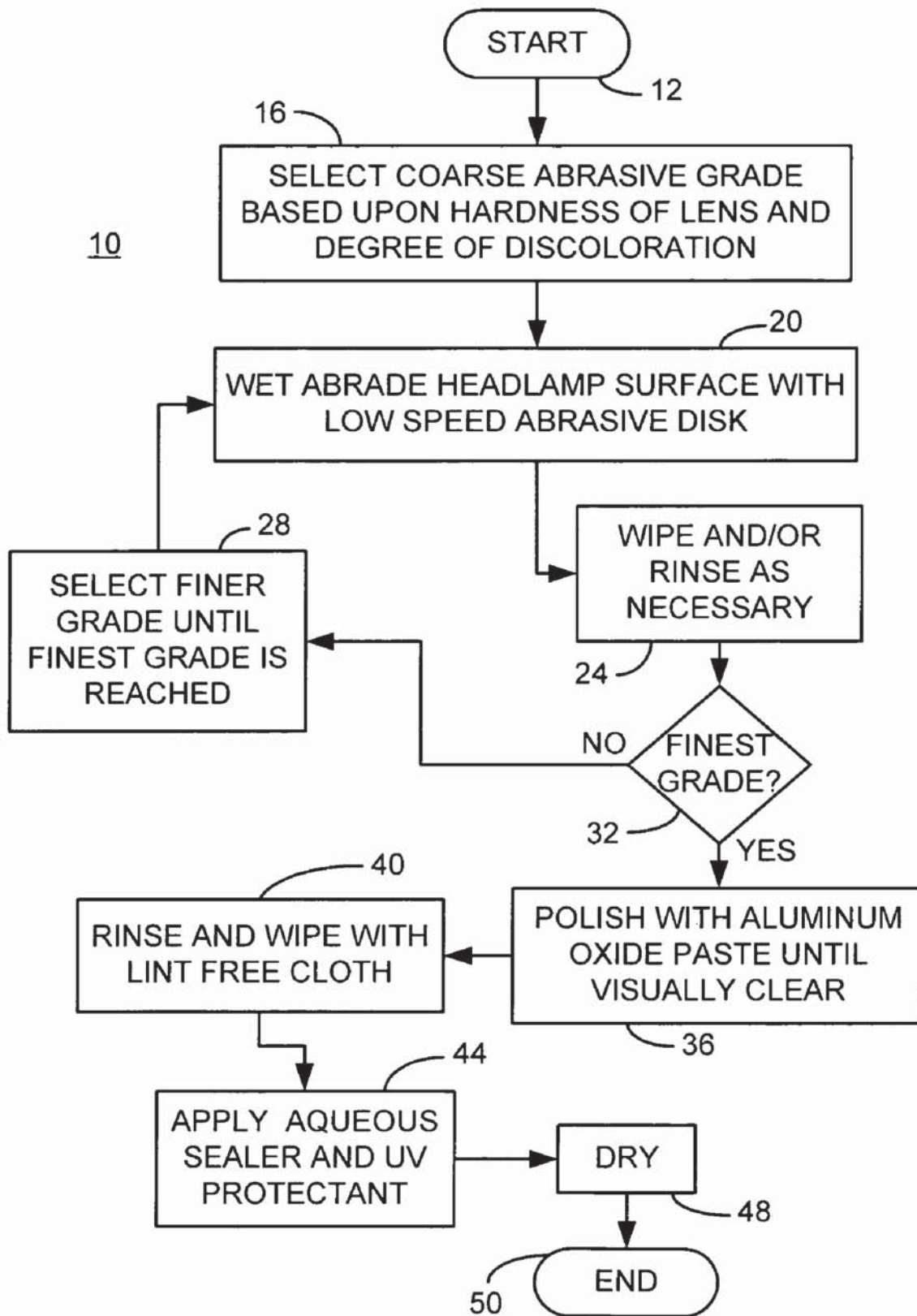


FIG 1

FIG. 2

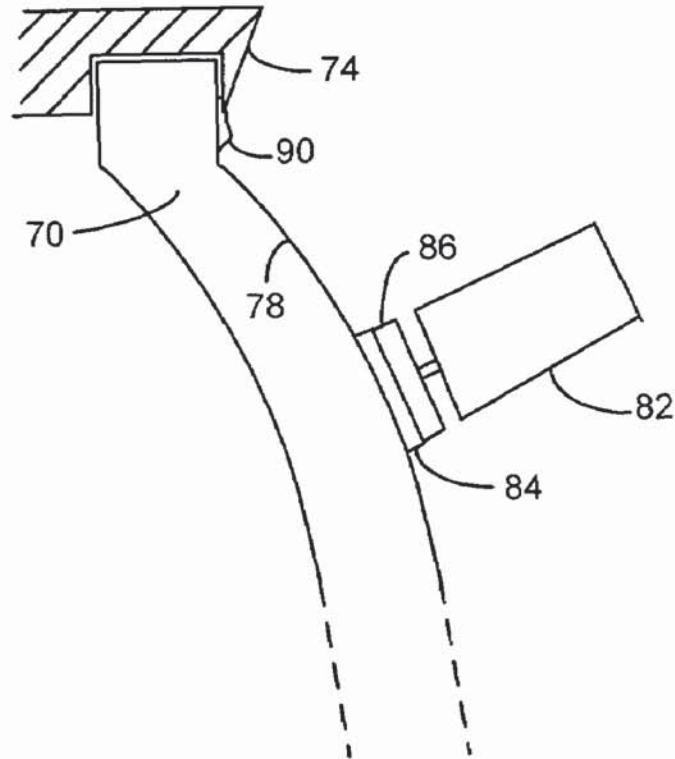
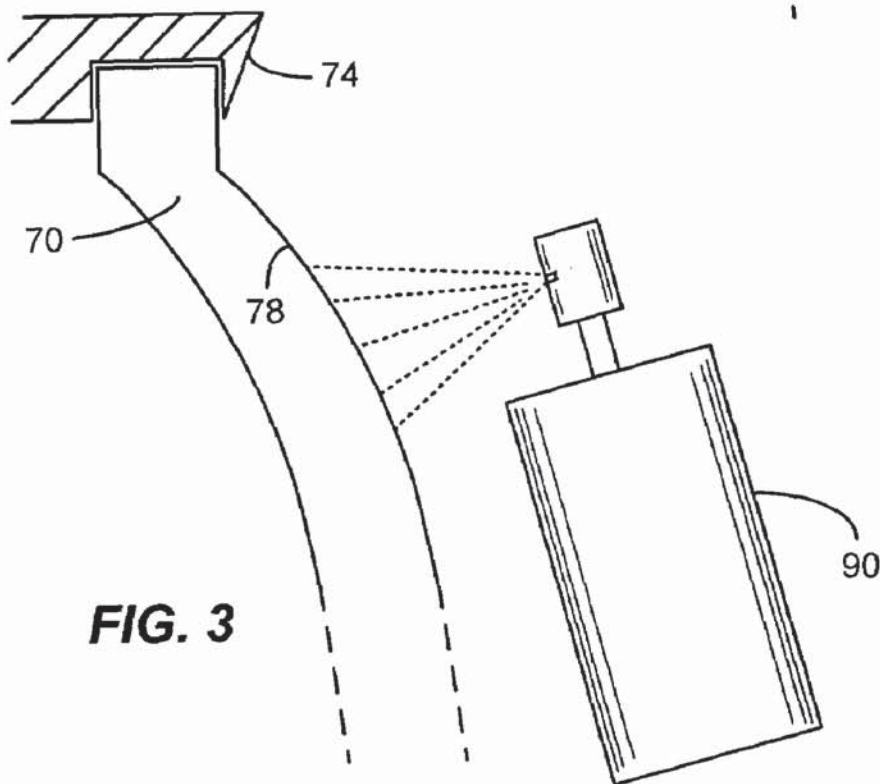


FIG. 3



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VEHICLE HEADLIGHT RESTORATION

BACKGROUND

As automobiles age and are exposed to sunlight, chemicals, pollution, soil, pollen, dust and other contaminants, the lenses of the headlights commonly take on a yellowish translucent or opaque appearance. This yellowish discoloration can be a surface film, an actual discoloration of the plastic commonly used to make such lenses or a combination of both. This discoloration is not only unsightly and detracting from an automobile's value, but also reduces the effective brightness and focus of the headlamps.

One solution to this problem is replacement of the lens assembly. Unfortunately, replacement lens assemblies are costly. The labor involved to replace such lens assemblies can further escalate the price of replacement to surprisingly high levels. Whether one wishes to sell a vehicle with discolored headlights or retain it, it is obviously desirable to keep the cost of restoration of discolored lenses to a minimum.

U.S. Pat. No. 6,831,041 describes a cleaning pad specifically made to clean headlight lenses. Various commercial products are also available on the market which are designed to restore headlight lenses. However, each has been found to have undesirable characteristics. For example, some products provide no protection against further damage and discoloration by the factors listed above, and others have in fact been used with unsatisfactory results by the current inventor. Other products contain harsh solvents and other chemicals which may either be dangerous to use or can potentially damage an automobile's paint. Still others are complicated multiple part systems.

BRIEF DESCRIPTION OF THE DRAWINGS

Certain illustrative embodiments illustrating organization and method of operation, together with objects and advantages may be best understood by reference to the detailed description that follows taken in conjunction with the accompanying drawings in which:

FIG. 1 is a flow chart of a method of headlight lens restoration consistent with certain embodiments of the present invention.

FIG. 2 illustrates an abrasive cleaning process consistent with certain embodiments of the present invention.

FIG. 3 illustrates a sealant application process consistent with certain embodiments of the present invention.

DETAILED DESCRIPTION

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail specific embodiments, with the understanding that the present disclosure of such embodiments is to be considered as an example of the principles and not intended to limit the invention to the specific embodiments shown and described. In the description below, like reference numerals are used to describe the same, similar or corresponding parts in the several views of the drawings.

The terms "a" or "an", as used herein, are defined as one or more than one. The term "plurality", as used herein, is defined as two or more than two. The term "another", as used herein, is defined as at least a second or more. The terms "including" and "comprising" are defined herein as defined

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used herein, is defined as connected, although not necessarily directly, and not necessarily mechanically.

Reference throughout this document to "one embodiment" or "certain embodiments", "an embodiment" or similar terms means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, the appearances of such phrases or in various places throughout this specification are not necessarily all referring to the same embodiment. Furthermore, the particular features, structures, or characteristics may be combined in any suitable manner in one or more embodiments without limitation.

The terms "sandpaper" and "abrasive paper" and similar terms as used herein are intended to embrace coated or otherwise abrasive paper, cloth, fabric, mesh or other substrate materials without limitation. Moreover, other abrasive materials having similar properties can be readily substituted as equivalents without departing from the invention. Accordingly, such terms should also be considered to embrace such equivalents.

In view of the above background, it is desirable to provide a method for restoration of discolored (e.g., yellowed) automobile, or other vehicle, headlight assemblies which can be safely, and effectively used while the headlight lens assembly remains attached to the automobile or other vehicle. Such a method should preferably provide long lasting protection, while posing minimal danger to the user. Further, such a method should pose minimal danger to paint, chrome, rubber and other components of the automobile.

Turning now to FIG. 1, a process 10 consistent with certain embodiments of the present invention is depicted in flow chart form starting at 12. An abrasive process is initially used to remove the film or yellowed portion of the lens surface starting at 16. At 16, a relatively coarse grit abrasive paper such as wet/dry sandpaper approximately in the range of grade 220 to 400.

Sandpaper is graded using at least three different systems: Coated Abrasives manufacturer's Institute (CAMI), Federation of European Producers Association (FEPA), and Japanese Industrial Standard (JIS). For purposes of this document, the example sandpaper grades are expressed using CAMI grading, but similar or corresponding grades (grits) from any other system can be utilized.

At 16, the starting abrasive can be selected based upon a number of factors including hardness of the headlight lens (e.g., lenses in certain Ford™ automobiles have been observed to be noticeably harder than certain other lenses), the level of discoloration, and the aggressiveness of the tool being used. Generally, abrading can begin with a wet/dry sandpaper grade between about 220 and 400, and selection is based upon experience. One can generally safely start with 400 grade and determine if it appears to be cutting at an adequately aggressive pace. If not, the process can start over with a coarser grade such as 220 or 320.

In certain embodiments, the abrading process of 20 is carried out using wet sanding with water and wet/dry sandpaper. The abrading can be carried out with a wet/dry sanding disk (approximately 7.6 cm in diameter has been found suitable) mounted to a flexible backing (e.g., a dense but flexible foam rubber backing) and driven by a low speed (actual speed has not been measured, but is roughly estimated to be in the range of several hundred to perhaps as much as 1000 RPM) rotary device such as an electric or pneumatic powered drill or other rotary tool. The speed of the system is selected to balance between speed of

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