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Rabinovich et al.

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(54) **METHODS FOR IMPROVING
PERFORMANCE OF HOLOGRAPHIC
GLASSES**

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This patent is subject to a terminal disclaimer.

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CPC ... **C03C 4/04** (2013.01); **C03C 3/04** (2013.01); **C03C 3/112** (2013.01); **G03H 1/0248** (2013.01); **G03H 2001/0268** (2013.01); **G03H 2001/2271** (2013.01); **G03H 2260/54** (2013.01)

(58) **Field of Classification Search**
CPC **C03C 4/04**; **C03C 3/04**; **C03C 3/112**;
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See application file for complete search history.

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(57) **ABSTRACT**

The improvement of the performance of holographic glasses with recorded holograms as measured by a figure of merit of the holographic glasses is disclosed. The improvement in the figure of merit of the holographic glasses is obtained at least in part with the addition of arsenic in the formation of the holographic glasses. The presence of arsenic increases the figure of merit as measured at a wavelength of interest of a holographic glass with a recorded hologram as compared to a holographic glass with a recorded hologram that does not contain arsenic.

7 Claims, 8 Drawing Sheets

| Constituent | Weight % glass | Weight % glass | |
|---------------------|-----------------|----------------|------------|
| | | narrow range | wide range |
| Silver | 0.0400 | 0.02-0.1 | 0.01-0.2 |
| Aluminum Oxide | 4.8001 | 3.0-6.0 | 2.0-10.0 |
| Arsenic Oxide(s) | 0.1375 | 0.05-0.2 | 0.02-0.4 |
| Bromine | 1.0000 | 0.5-1.5 | 0.2-2.0 |
| Cerium Oxide(s) | 0.0500 | 0.03-0.1 | 0.01-0.2 |
| Fluorine | 2.3001 | 1.5-2.7 | 1.0-3.0 |
| Potassium Oxide | 0.5900 | 0.3-1.0 | 0.1-2.0 |
| Sodium Oxide | 15.8404 | 12.0-20.0 | 10.0-25.0 |
| Silicon Oxide | 68.4217 | 65.0-70.0 | 55-75 |
| Tin Oxide(s) | 0.0100 | 0.005-0.02 | 0.001-0.1 |
| Zinc Oxide | 6.8102 | 5.0-10.0 | 3.0-15.0 |
| TOTAL OXIDES | 100.0000 | | |