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Jordanov et al.

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(54) **REFLECTIVE MEDICAL MARKERS AND METHODS OF MANUFACTURE**

(56) **References Cited**

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U.S. PATENT DOCUMENTS

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 284 days.

4,152,046	A *	5/1979	Knapp	359/514
4,466,698	A *	8/1984	Grantz	116/18
6,120,636	A *	9/2000	Nilsen et al.	156/230
6,127,020	A *	10/2000	Bacon et al.	428/161
6,760,157	B1 *	7/2004	Allen et al.	359/487.02
7,874,686	B2 *	1/2011	Rossner et al.	359/515
8,235,537	B2 *	8/2012	Glembocki et al.	359/529

* cited by examiner

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(57) **ABSTRACT**

(51) **Int. Cl.**
G02B 5/12 (2006.01)

Identical plastic hemispheres are first treated with organic solvent, which is smeared by a pillow of microporous silicon rubber to achieve a slippery surface upon the hemispheres. The slippery surface upon the hemispheres may comprise a layer of melted plastic. Hemispheres are then placed under an application chamber, where hot gas under pressure softens, deforms and transports a sheet of marker foil over the hemisphere. Two hemispheres are then joined together by use of asymmetric voids and a clip pin inserted, while under compression, into the hemispheres.

(52) **U.S. Cl.**
USPC **359/515; 359/900**

(58) **Field of Classification Search**
USPC **359/515 533**
See application file for complete search history.

5 Claims, 7 Drawing Sheets

