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Vasylyev

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(54) **LIGHT TRAPPING OPTICAL COVER**

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G02B 6/32 (2006.01)
G02F 1/1333 (2006.01)
H02N 6/00 (2006.01)

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(58) **Field of Classification Search** 385/33–36, 385/900; 349/56–67; 136/246, 256–257
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

|				
4,461,278	A	*	7/1984	Mori 126/700
5,801,795	A	*	9/1998	Ogino 349/5
6,064,452	A	*	5/2000	Ogino 349/57
6,274,860	B1		8/2001	Rosenberg
6,333,458	B1		12/2001	Forrest et al.
6,440,769	B2		8/2002	Peumans et al.
7,672,549	B2		3/2010	Ghosh et al.
7,817,885	B1	*	10/2010	Moore et al. 385/33
7,873,257	B2	*	1/2011	Morgan 385/146
2004/0103938	A1		6/2004	Rider
2008/0223438	A1	*	9/2008	Xiang et al. 136/257
2008/0264483	A1		10/2008	Keshner et al.
2008/0271776	A1	*	11/2008	Morgan 136/246
2009/0126792	A1		5/2009	Gruhlke et al.
2009/0296194	A1	*	12/2009	Gally et al. 359/291
2010/0186798	A1		7/2010	Tourmen et al.
2010/0278480	A1		11/2010	Vasylyev
2011/0226332	A1		9/2011	Ford et al.
2012/0012741	A1		1/2012	Vasylyev

* cited by examiner

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(57) **ABSTRACT**

A light trapping optical cover employing an optically transparent layer with a plurality of light deflecting elements. The transparent layer is configured for an unimpeded light passage through its body and has a broad light input surface and an opposing broad light output surface. The light deflecting elements deflect light incident into the transparent layer at a sufficiently high bend angle with respect to a surface normal and direct the deflected light toward a light harvesting device adjacent to the light output surface. The deflected light is retained by means of at least TIR in the system formed by the optical cover and the light harvesting device which allows for longer light propagation paths through the photoabsorptive layer of the device and for an improved light absorption. The optical cover may further employ a focusing array of light collectors being pairwise associated with the respective light deflecting elements.
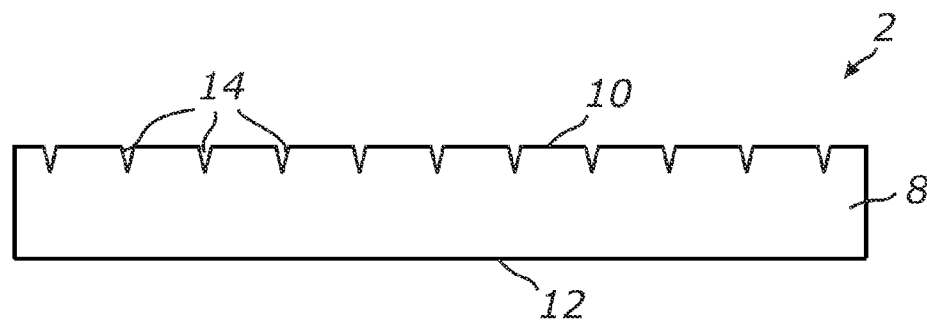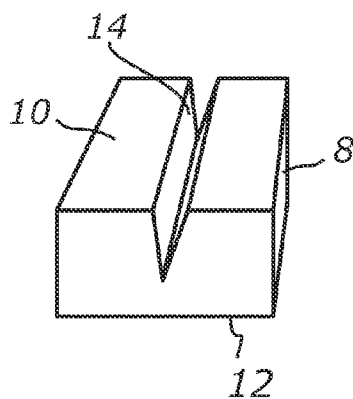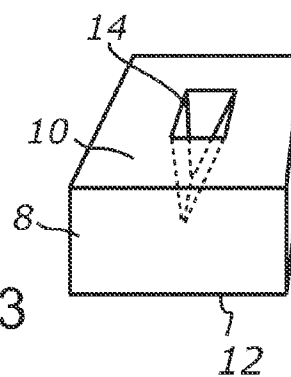
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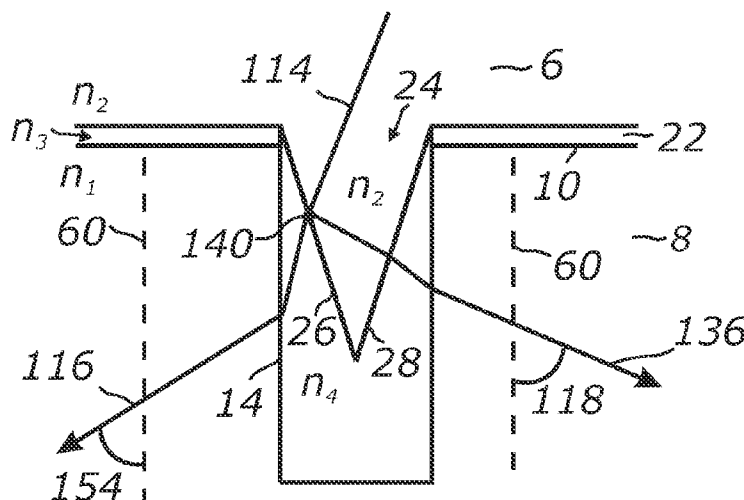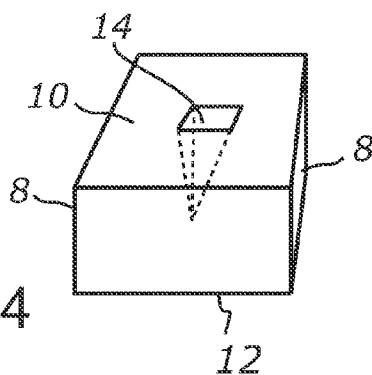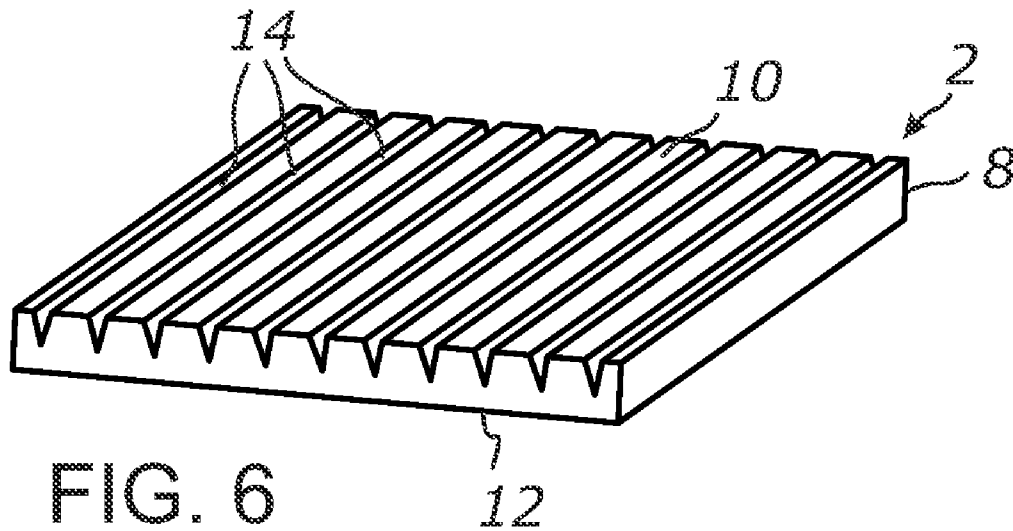
FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5
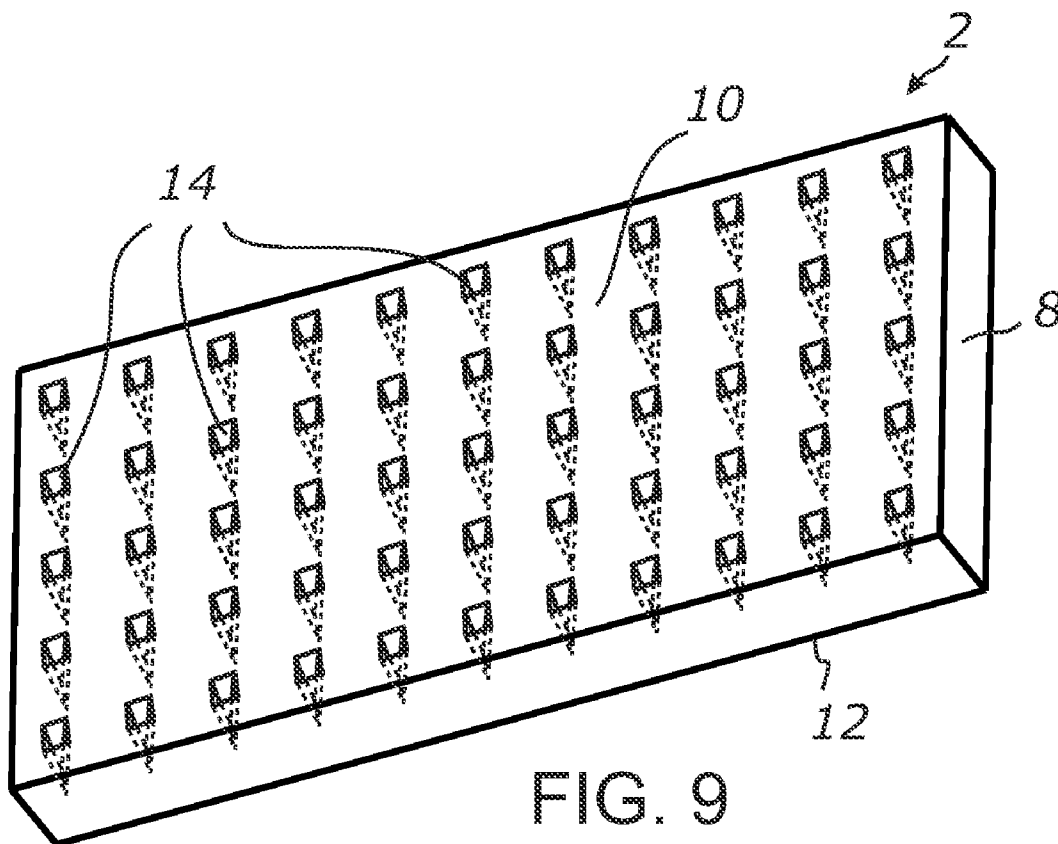
FIG. 6

FIG. 7
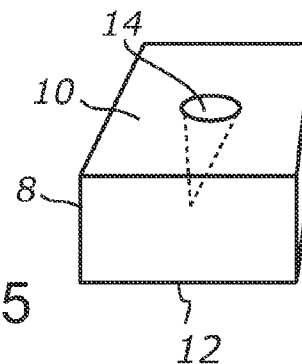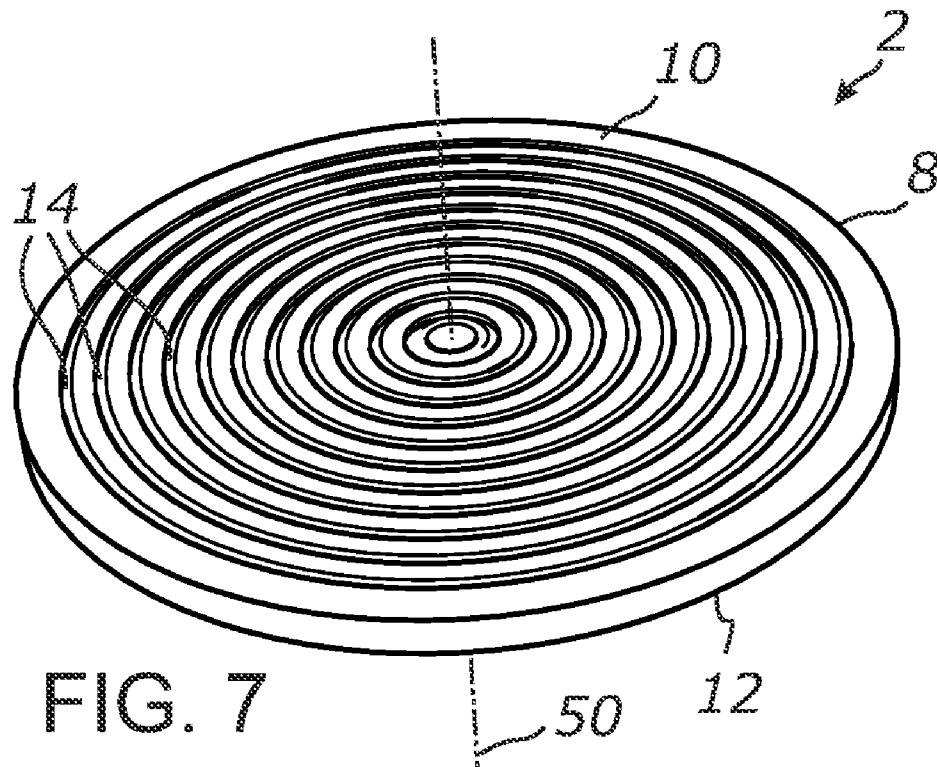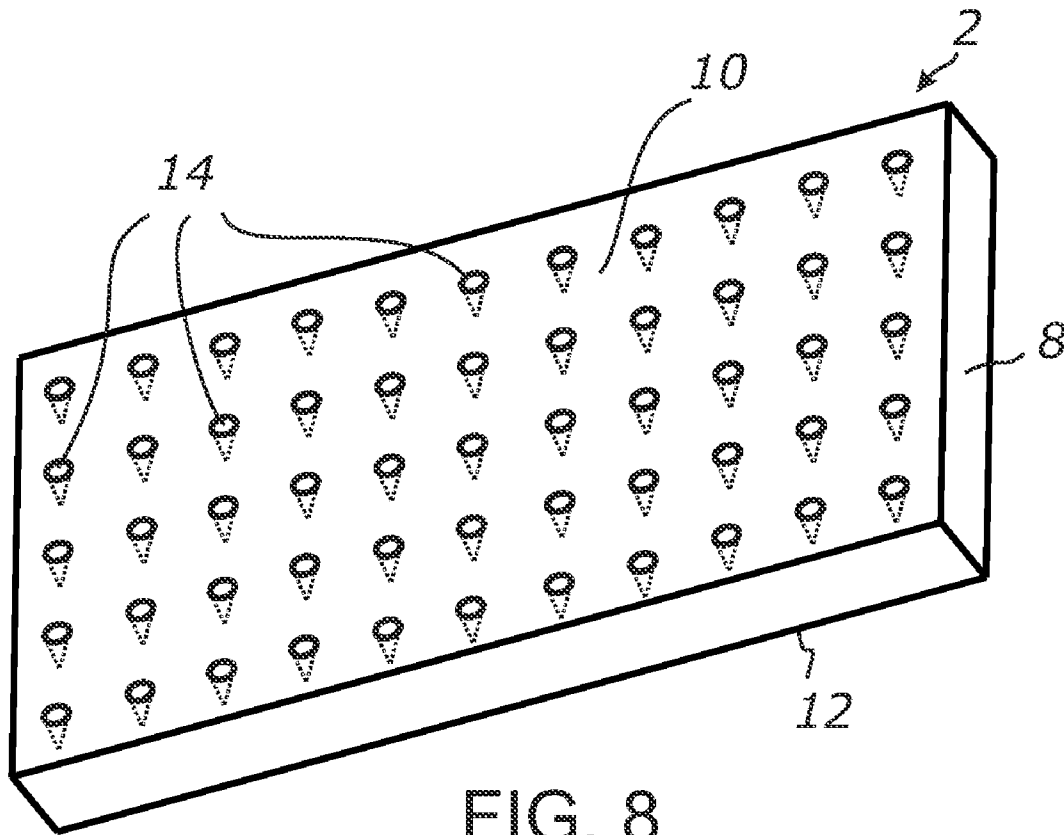
FIG. 8

FIG. 9

FIG. 10

FIG. 11

DOCKET ALARM
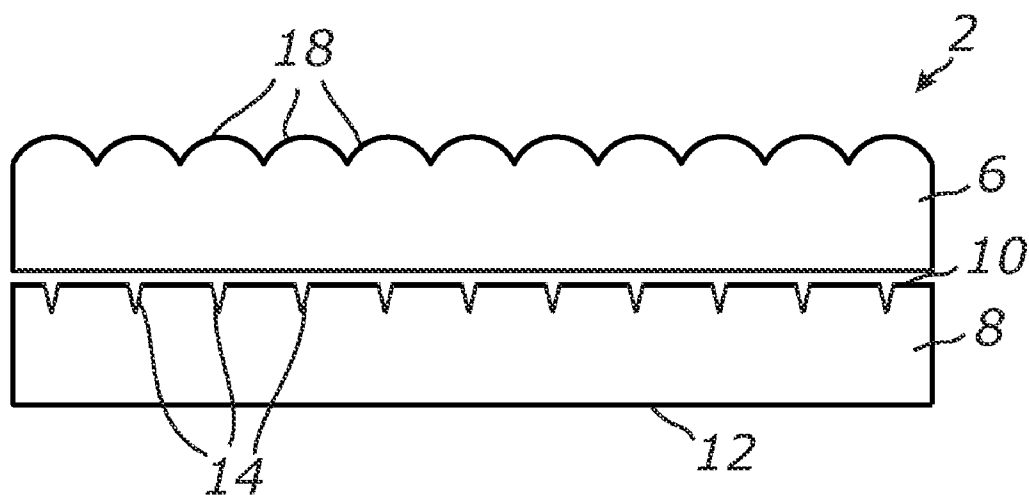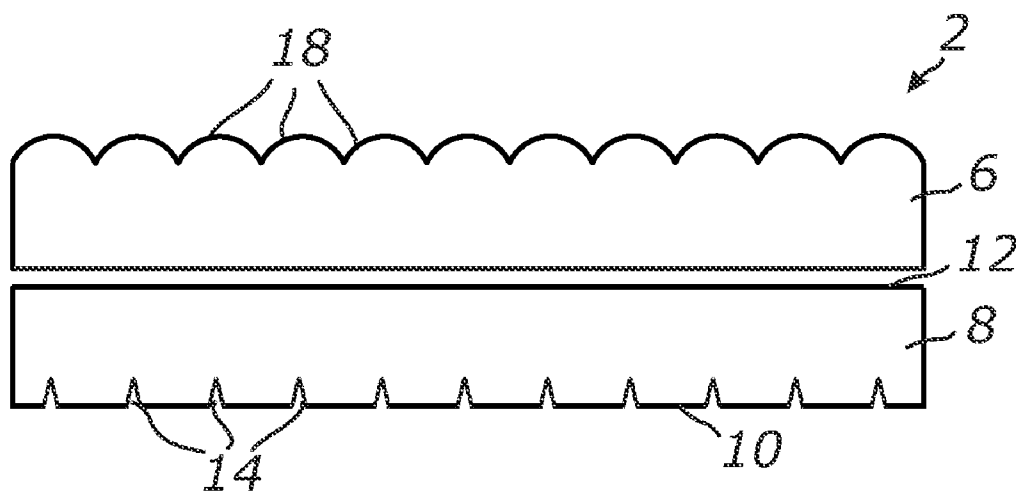
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