

EXHIBIT 1056

U.S. PATENT NO. 4,839,729 TO ANDO *et al.*

(“the ‘729 Patent” or “ANDO”)

TRW Automotive U.S. LLC: EXHIBIT 1056  
PETITION FOR *INTER PARTES* REVIEW  
OF U.S. PATENT NUMBER 8,599,001  
IPR2015-00436

[54] SOLID STATE IMAGE SENSOR

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[22] Filed: Apr. 26, 1988

[30] Foreign Application Priority Data

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[51] Int. Cl.<sup>4</sup> ..... H04N 3/14; H04N 5/335; H01J 40/14

[52] U.S. Cl. .... 358/213.16; 358/213.15; 358/163; 358/167; 358/225

[58] Field of Search ..... 358/213.15, 213.16, 358/211, 213.19, 163, 167, 166, 168, 336

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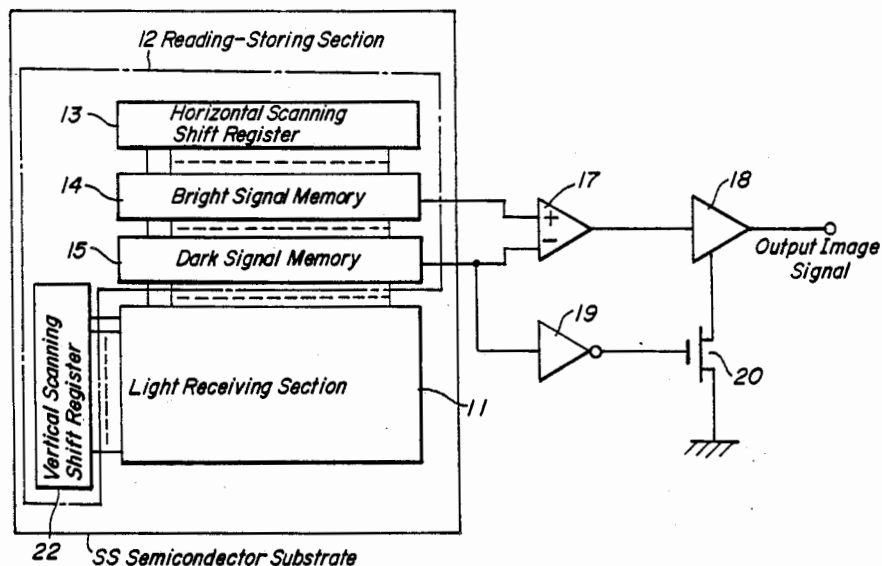
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Primary Examiner—Jin F. Ng  
Assistant Examiner—Mehdi Haghani  
Attorney, Agent, or Firm—Arnold, White & Durkee

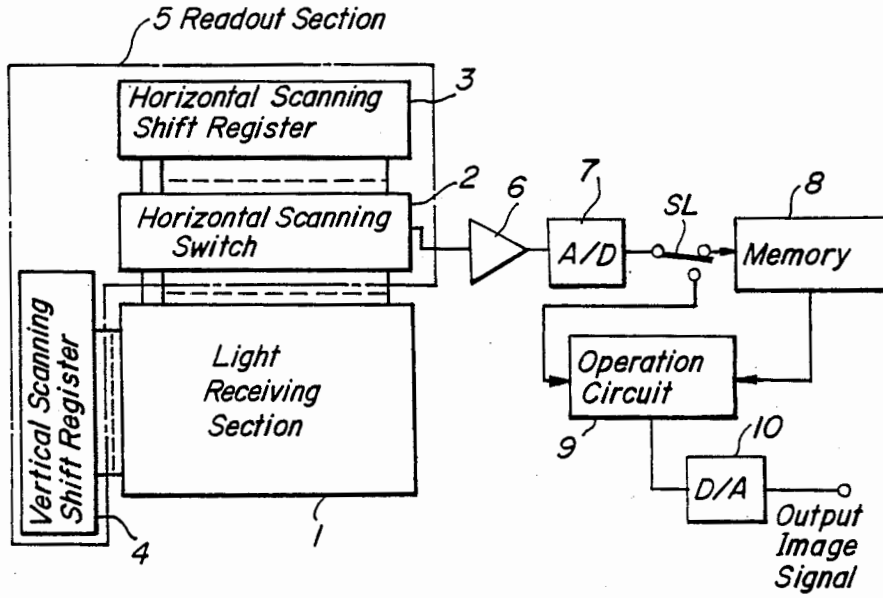
[57] ABSTRACT

A solid state image sensor including a light receiving section having a number of light receiving cells arranged in matrix, and a reading and storing section having a first set of switching and memory transistors for reading bright signals read out of light receiving cells arranged in a row and storing the same for a horizontal scanning period, a second set of switching and memory transistors for reading dark signals out of light receiving cells arranged in a row and storing the same for a horizontal scanning period, and a set of reading transistors for reading the bright and dark signals simultaneously out of the first and second sets of memory transistors for respective pixels successively. The light receiving section and the reading and storing section are formed integrally in the same semiconductor substrate. In order to remove the fixed pattern noise, there is derived differences between the simultaneously readout bright and dark signals with the aid of a differential amplifier.

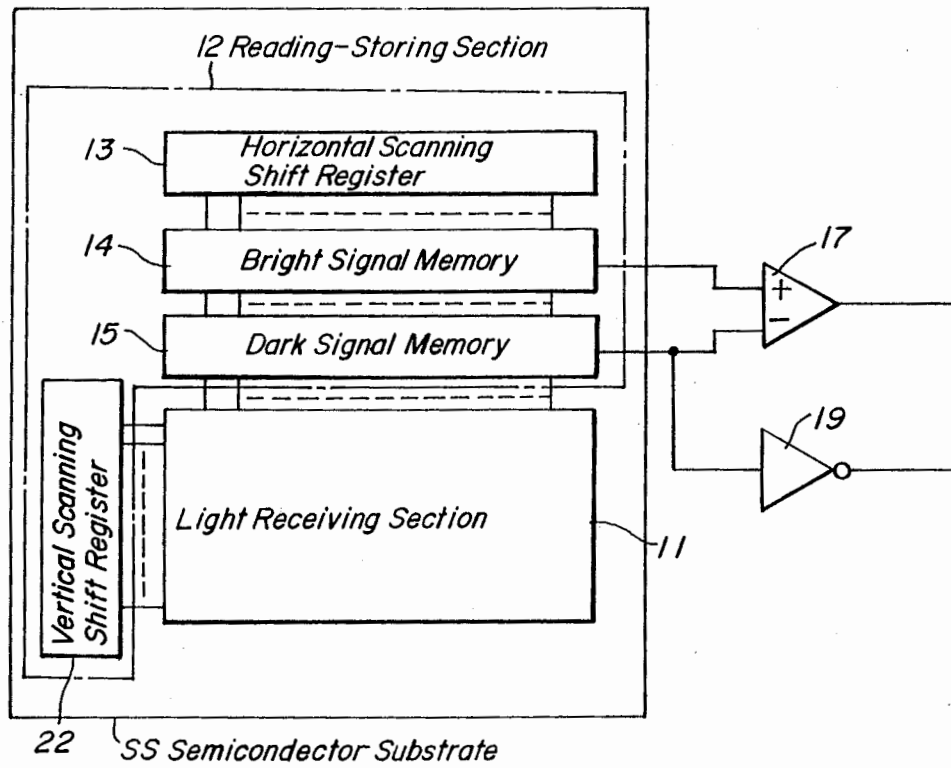
11 Claims, 5 Drawing Sheets

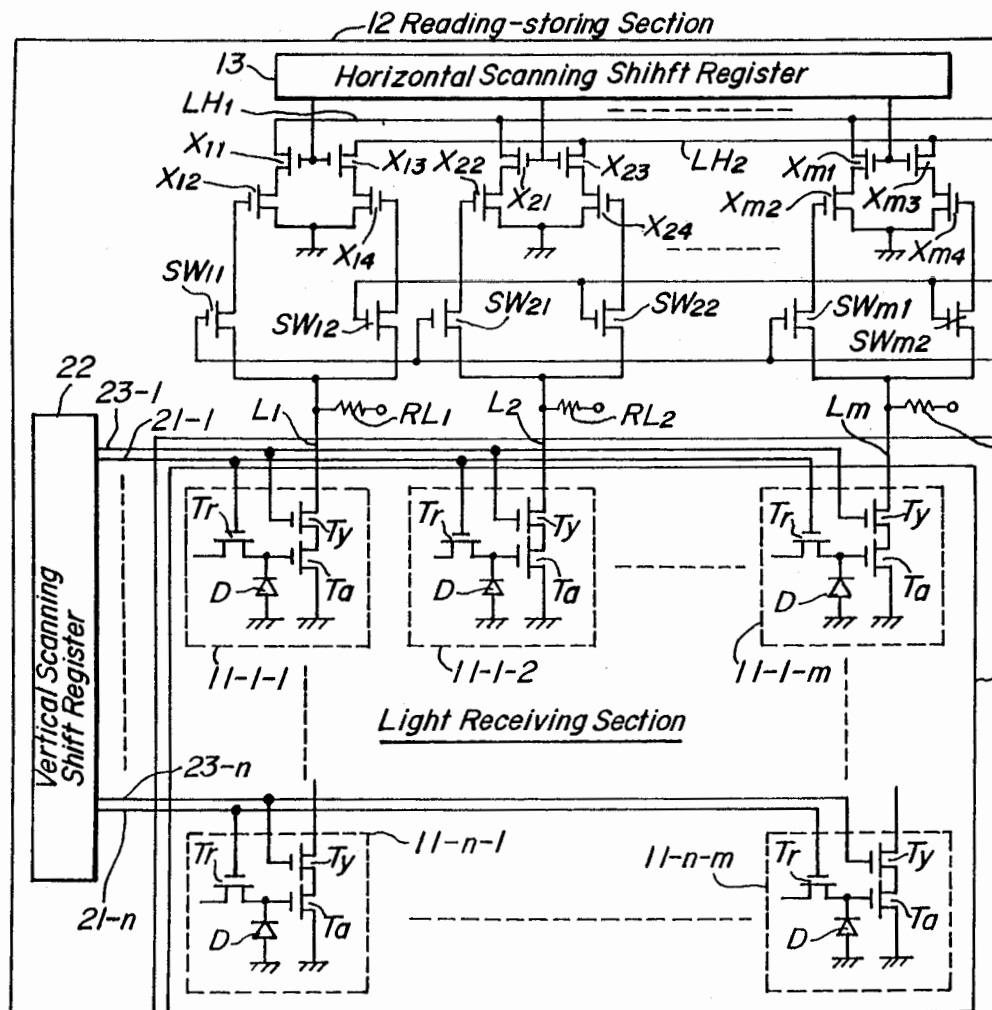


**FIG. 1** PRIOR ART



**FIG.2**





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