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(54) **DOWNSCAN IMAGING SONAR**

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See application file for complete search history.

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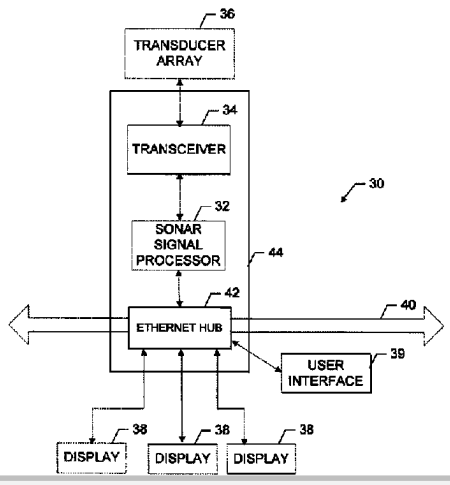
(57) **ABSTRACT**

A downscan imaging sonar utilizes a linear transducer element to provide improved images of the sea floor and other objects in the water column beneath a vessel. A transducer array may include a plurality of transducer elements and each one of the plurality of transducer elements may include a substantially rectangular shape configured to produce a sonar beam having a beamwidth in a direction parallel to longitudinal length of the transducer elements that is significantly less than a beamwidth of the sonar beam in a direction perpendicular to the longitudinal length of the transducer elements. The plurality of transducer elements may be positioned such that longitudinal lengths of at least two of the plurality of transducer elements are parallel to each other. The plurality of transducer elements may also include at least a first linear transducer element, a second linear transducer element and a third linear transducer element. The first linear transducer element may be positioned within the housing to project sonar pulses from a first side of the housing in a direction substantially perpendicular to a centerline of the housing. The second linear transducer element may be positioned within the housing to lie in a plane with the first linear transducer element and project sonar pulses from a second side of the housing that is substantially opposite of the first side. The third linear transducer element may be positioned within the housing to project sonar pulses in a direction substantially perpendicular to the plane.

73 Claims, 23 Drawing Sheets
(5 of 23 Drawing Sheet(s) Filed in Color)



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