140. With reference to **FIG. 8**, it will be appreciated that the presence of the thin lead tabs **138, 140** prevents the hard bias layers from contacting the flat surface of **128** of the sensor, ensuring that only the side portions **136, 134** of the sensor **126** contact the hard bias material **146, 148** and eliminating the "birds beak" problem associated with the prior art. First and second electrically conductive leads **150, 152** are formed over the hard bias material, and over a portion of the thin lead tabs **138, 140**, and terminate at inner edges **154, 156**. Advantageously, the precise location of the inner edges **154, 156** is not critical, however the inner edges **154, 156** somewhere along the top of the thin lead tabs **138, 140**, and preferably somewhere near the center of the tabs **138, 140**. Like the tabs **138, 140**, the leads **146, 148** preferably comprise Rh, although they could be constructed of many electrically conductive materials. The leads **150, 152** could be of various thicknesses, but are preferably 60 to 80 nm, and more preferably are roughly 70 nm thick.

[**0041**] With reference now to **FIGS. 9 through 13**, a method **1300** of manufacturing a read head according to the present invention is described. With particular reference to **FIGS. 9 and 14**, in a step **1302** a substrate **12** is provided. This can be for example, the electrically insulating, non-magnetic gap layer **12**, which can itself be formed upon another substrate, such as silicon. Then, in a step **1304**, a full film of magnetoresistive materials **158** is deposited. Those skilled in the art will recognize that the full film of magnetoresistive materials **158** is not a single film layer but actually comprises the various material layers making up a magneotresistive sensor such as the GMR sensor described with reference to the prior art. The full film magnetoresistive materials **158** could also comprise various material layers making up some other type of magnetoresistive sensor, such as for example an AMR or TMR sensor. After the sensor material **158** has been deposited, in a step **1306** a first photoresist mask **160** is formed having openings **162** formed to define the lead tabs **138, 140** described with reference to **FIG. 9**. The first photoresist layer **160** is preferably a bi-layer photoresist, which facilitates later lift off of the resist layer, but could also be some other mask, such as for example a single layer photoresist mask or a mask made of a material other than photoresist.

[**0042**] With the first mask **160** in place, in a step **1308**, a thin full film layer of electrically conductive material **164** is deposited, preferably by sputtering or some similar method. The electrically conductive material could be for example Rh or could be some other material. Thereafter, in a step **1310**, a thin layer of a mill resistant material **165** is deposited. This mill resistant material **165** could be for example, Ta or some other material that is relatively resistant to the material removal process that will be discussed further below. The mask **160** causes the deposited electrically conductive mill resistant materials **164, 165** to define the first and second lead tabs **138, 140**. The materials **164, 165** are deposited relatively thin as compared with the major portion of the leads **152 (FIG. 8)**. This is advantageous in that it prevents sealing off the first photoresist mask **160**, allowing a thinner Mask to be used. A thin mask structure provides more accurate definition of the deposited material. The thin profile of the layer **162** allows the lead tabs **138, 140** to be deposited evenly, with relatively abrupt, well defined and accurately located edges inner edges **142, 144** and outer edges **166, 168**. Therefore, the thin profile of the layer **162** allows the sensor **124** to be constructed with a narrower, better controlled trackwidth. Another important advantage of the present invention is that the photolithographic, and deposition steps **1406, 1408** that define the edges **142, 144, 166, 168** are perfomed on a planar surface. Those skilled in the art will recognize such a flat topography significantly improves the accuracy of the photolithographic process used to construct the mask **160**, further facilitating the definition of narrower, better controlled tack widths, and symetrical read element **124**. After the layer of electrically conductive material **162** has been deposited, in a step **1312**, the mask **160** is lifted off using methods familiar to those skilled in the art.

[**0043**] With reference now to **FIGS. 10 and 13**, in a step **1314**, a second mask layer **170** is formed. Like the first mask **160**, this second mask **170** can be formed as a bi-layer photoresist, by a photolithographic process. This second mask **170** is configured to cover the space between the tabs and covers at least a portion of each of the lead tabs **138, 140**. With the mask **170** in place, in a step **1316**, a material removal process represented by arrows **172** is performed. This material removal process is preferably an ion milling operation, but could be some other procedure, such as for example reactive ion etching (RIE). During the material removal procedure **1316**, that portion of the sensor material **158** not protected by the mask **170** and lead tabs **138, 140** is removed, resulting in a structure as depicted in **FIG. 11**. It will be appreciated that the the mill resistant material **165** covering the electrically conductive layer **164** of each of the lead pads **138, 140** will prevent the lead pads from being removed by the material removal (milling) operation. The material removal procedure **1316** defines the sensor element **126** from the sensor material layer **158**. The formed sensor **126** has a flat upper surface **128** terminating in laterally opposed side edges **130, 132** and having sides **134, 136**.

[**0044**] With reference now to **FIGS. 12 and 13**, in a step **1318** with the second mask **170** still in place, a layer of hard magnetic material **172** is deposited. This produces the hard bias layers **146, 148** described earlier with reference to **FIG. 8**. The deposition of the hard magnetic material **172** is performed relatively vertical or normal to the plane of the wafer (not shown). Then, with continued reference to **FIGS. 12 and 14**, in a step **1320**, an electrically conductive lead material **174** is deposited forming the leads **150, 152** described with reference to **FIG. 8**. The deposition of the lead material **172** is preferably performed at an angle to the wafer normal on a rotating wafer according to techniques that will be familiar to those skilled in the art. This angled deposition allows the lead material to be deposited further into the undercuts **174, 176** of the bi-layer resist structure **165** such that the deposited material **172** will be in direct electrical contact with the pads **138, 140**. Because the deposition process is performed in a sputtering chamber on a rotating platter, the angled deposition will provide even deposition with each of the undercuts **176, 174**. Since the track width TW, overall sensor width and sensor symetry have already been defined by the first photolithographic process that produced the lead tabs **138, 140**, the precise allignment of the second photolithographic mask **170** is not critical. This advantageous self alignement allows manufacture of a symetrical sensor having a very narrow track width. The self alignment is due to the fact that the track width and sensor edges are defined in a single photolithographic step using a single photolithographic mask.