SHIELDED MAGNETIC TUNNEL JUNCTION MAGNETORESISTIVE READ HEAD

ABSTRACT

A magnetic tunnel junction (MTJ) magnetoresistive read head for a magnetic recording system has the MTJ device located between two spaced-apart magnetic shields (S1,S2). The magnetic shields (S1,S2) allow the head (25) to detect individual magnetic transitions from the magnetic recording medium (16) without interference from neighboring transitions. Electrically conductive spacer layers connect the MTJ device to the shields (S1,S2). The thickness of the spacer layers is selected to optimize the spacing between the shields, which is a parameter that controls the linear resolution of the data that can be read from the magnetic recording medium. To reduce the likelihood of electrical shorting between the shields (S1,S2) if the shield-to-shield spacing is too small, each of the shields (S1,S2) can have a pedestal region with the MTJ device located between two pedestals (P1,P2), so that the shield-to-shield spacing outside the pedestal regions (P1,P2) is greater than in the pedestal regions (P1,P2).

Fig 4A