

LONG SATURATION ZONE MAGNETIC WRITE HEAD

ABSTRACT OF THE DISCLOSURE

In a magnetic write head, the top pole piece reduces in width and cross-sectional area in a number of steps by providing a first wide tapered zone whose width progressively decreases at a first rate that is determined by side surfaces that are inclined at an angle of about 45 to 55-degrees, and providing a second narrow tapered zone whose width progressively decreases at a second lower rate that is determined by side surfaces that are inclined at an angle of about 5-degrees. This second narrow tapered zone may comprise the serial arrangement of three individual zones, a first of which whose width decreases at a rate that is determined by side that are inclined at about 4.7-degrees, a second of which whose width decreases at a rate that is determined by side that are inclined at about 5.7-degrees, and third of which whose width decreases at a rate that is determined by sides that are inclined at about 6.8-degrees. The pole piece's tapered zone terminates in a narrow and constant width pole tip. As a result, a long magnetic flux saturation zone is provided, wherein length is measured in a direction that extends toward the head's pole tip or write gap. A gap field versus write current (B_g -vs- I_w) curve is thereby provided having a high magnitude B_g and nearly flat slope B_g saturation region. The head is driven with an excess magnitude I_w , thus causing the head's B_g to increase rapidly to its optimum high magnitude, whereupon the increase in B_g abruptly stops. Better overwrite (OVW) is provided, less non linear transition shift (NLTS) occurs, and narrower read-back pulses are provided, at both the inner diameter (ID) and outer diameter (OD) of an associated magnetic recording disk.

FIGURE 4