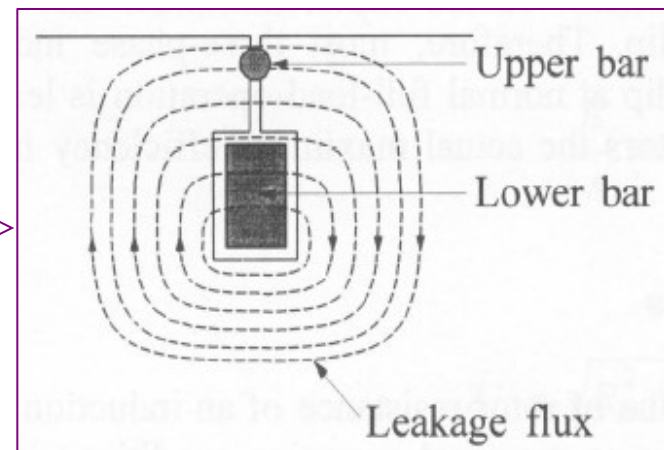


# **Special Electrical Machines**

## Double Cage Squirrel-Cage Rotor Construction

- Following double squirrel-cage arrangements can also be used to obtain a high value of effective resistance at starting and a low value of the resistance at full-load operation.
- It consists of two layers of bars, both short-circuited by end rings.
- The upper bars are small in cross-section and have a high resistance.
- They are placed near the rotor surface so that the leakage flux sees a path of high reluctance; consequently, they have a low leakage inductance.
- The lower bars have a large cross-section, a lower resistance and a high leakage inductance. Permeability of upper cage is low so most of flux lies around inner cage, little flux around outer cage. Permeability is reciprocal of Conductivity.

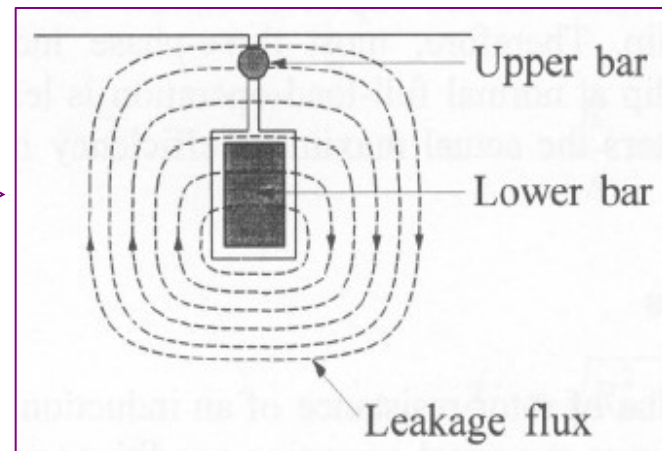
Double squirrel-cage rotor bars



## Double Cage Squirrel-Cage Rotor Construction (cont'd)

- At starting, rotor frequency is high and very little current flows through the lower bars; the effective resistance of the rotor is then the high resistance upper bars, leakage reactance is low of upper or outer cage is low.
- At normal low slip operation, leakage reactances are negligible, and the rotor current flows largely through the low resistance lower bars; the effective rotor resistance is equal to that of the two sets of bars in parallel.

Double squirrel-cage rotor bars



**THANKS....**

Queries Please...