15.

kth head is achieved on nth toss if previous $n-1$ tosses produced $k-1$ heads and nth toss was a head i.e. Probability $= \binom{n-1}{k-1} p^{k-1}(1-p)^{n-k} \times p = \binom{n-1}{k-1} p^{k}(1-p)^{n-k}$

Given that it took an even number of tosses to achieve exactly $k-1$ heads then the kth head will occur on an even numbered toss if we have an odd number of tails followed by a head

so probability $= p \sum_{r=1}^{\infty} (1-p)^{2r-1} = p \times \frac{(1-p)}{1-(1-p)^2} = \frac{(1-p)}{2-p}$ (sum of infinite G.P)

P(first head occurs on an odd numbered toss) $= \frac{(1-p)^2}{2-p}$

So P(Exactly two heads are on even numbered tosses) $= 3 \times \left[\frac{(1-p)}{2-p} \right]^2 \frac{(1-p)^2}{2-p} = \frac{3(1-p)^3}{(2-p)^2}$