Given a polynomial of the form \( f(x, z) = g(z) + h(x) \), let \( f^{(0)}(x) = 0 \) and \( f^{(n)}(x) = g(f^{(n-1)}) + h(x) \) for \( n \geq 1 \). Set \( f_\infty(x) = \lim_{n \to \infty} f^{(n)}(x) \). We give conditions on \( g(z) \) and \( h(x) \) so that the power series \( f_\infty(x) = \sum_{k=0}^{\infty} a_k x^k \) exists, and provide combinatorial interpretations of the coefficients \( a_k \) in terms of polygonal partitions. In particular, we provide examples of \( g(z) \) and \( h(x) \) such that the nonzero coefficients of \( f_\infty(x) \) are the Catalan numbers \( C_k = \frac{1}{k+1} \binom{2k}{k} \), the multivariate Fuss-Catalan numbers \( C_k^{(d)} = \frac{1}{(d-1)k+1} \binom{dk}{k} \), and a “non-homogeneous” generalization of the Fuss-Catalan numbers. (Received September 17, 2013)