In this talk I will present recent results on composition operators, C_ϕ, acting on the Hardy spaces whose symbol, ϕ, is a universal covering map of the disk onto a finitely connected domain of the form $\mathcal{D}_0 \backslash \{p_1, \cdots, p_n\}$. Here $\mathcal{D}_0$ is simply connected and p_i, $i = 1, \ldots, n$, are distinct points in the interior of $\mathcal{D}_0$. We consider, in particular, conditions that determine compactness of such operators and demonstrate a link with the Poincare series of the uniformizing Fuchsian group. We show that C_ϕ is compact if, and only if ϕ does not have a finite angular derivative at any point of the unit circle, thereby extending the result for univalent and finitely multivalent ϕ.