We compute the spectrum of the corona $G \circ H$ of two graphs, $G$ and $H$. In particular, we introduce a new invariant, the coronal of a graph, and show that the spectrum of $G \circ H$ is completely determined by the spectra of $G$ and $H$ and the coronal of $H$. We compute the coronals explicitly for several families of graphs, including regular graphs, complete $n$-partite graphs, and path graphs. Finally, we use the corona construction to generate many infinite families of pairs of cospectral graphs. (Received September 21, 2009)