We consider the functional

$$J(u) = \int_{\Omega} [f(|Du|) - u] dx,$$

where Ω is a bounded domain and f is a convex function. Under general assumptions on f, G. Crasta has shown that if J admits a minimizer in $W_0^{1,1}(\Omega)$ depending only on the distance from the boundary of Ω, then Ω must be a ball. With some restriction on f and minimizing J in $W_0^{1,\infty}(\Omega)$, we prove that in order to get such spherical symmetry it is enough to assume that the minimizer of J has only a level surface parallel to the boundary. We then discuss how these results extend to more general settings. A particular attention will be devoted to very degenerate functionals, that is for f vanishing in an interval $[0, \sigma]$, with $\sigma > 0$. In this case, we will also show that the minimizer u is unique and satisfies an equation of the form

$$\min(F(\nabla u, D^2 u), |\nabla u| - \sigma) = 0$$

in the viscosity sense.