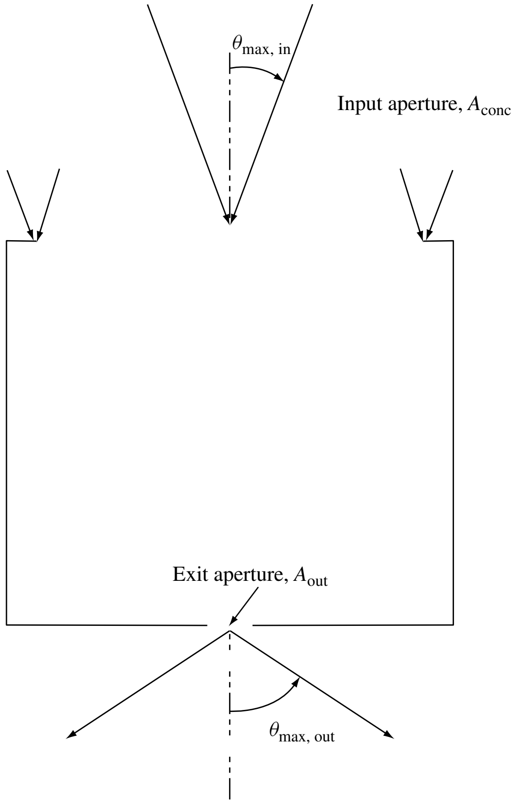

Figure 11.19 Schematic representation of a generalized concentrator

and

$$C = A_{conc}/A_{rec} \leq C_{max} = n^2 \sin^2(\theta_{max,out})/\sin^2(\theta_{max,in})$$

respectively. A concentrator that achieves this maximum is called an *ideal* concentrator.

Some observations are in order. First, in order to attain the maximum concentration, it is necessary to have $\theta_{max,out}$ as large as practical. The maximum it could be is 90°, but even angles approaching this result in many rays striking the receiver at grazing angles. This may prove impractical, as such rays are prone to have high reflectance and can easily miss the target owing to mechanical alignment errors. The above equations are often stated when $\theta_{max,out} = 90°$, whereby they become

$$C = A_{conc}/A_{rec} \leq C_{max} = n/\sin(\theta_{max,in})$$

and

$$C = A_{conc}/A_{rec} \leq C_{max} = n^2/\sin^2(\theta_{max,in})$$

in the two and three-dimensional case, respectively. The designer is cautioned, however, not to persist in designing concentrators with very large exit angles just to gain higher concentration ratio.