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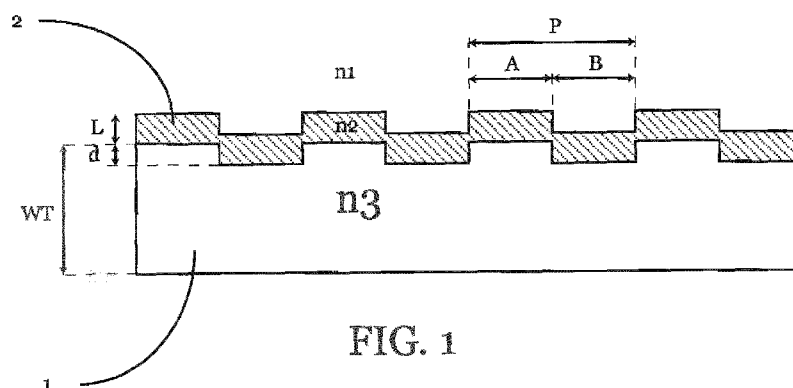
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(54) **Title:** METHOD TO OPTIMIZE A LIGHT COUPLING WAVEGUIDE

**FIG. 1**

(57) **Abstract:** The present invention concerns a method for constructing a light coupling system wherein a grating is manufactured on the surface of a multimode waveguide and defines the entrance of the waveguide for an incident light beam, said grating comprising a repetition of patterns. The grating is defined by a set of parameters comprising: • grating period (P), separating two adjacent patterns, • grating depth (d) between the highest and the lowest point of the pattern, • incident angle mean value (θ) of the incident light with respect to the waveguide. The method comprises a step of optimization of the set of parameters to obtain an optimized second set of parameters, in order to obtain a transmission efficiency (C_e) of the incident light into said waveguide for the first or the second diffractive order exceeding 35% for unpolarized light, or exceeding 50% for polarized light, at a given wavelength of the incident light.