second waveguide section 302 and the ends of the resistive heating pad 304 are aligned (in a direction parallel to the direction of propagation of the light). In other examples (not shown in the figures), however, the length of the second waveguide section 302 (as measured along the direction of propagation of the light) may be longer (e.g. only slightly longer) than the length of the resistive heating pad 304, such that the resistive heating pad 304 terminates before the end(s) of the second waveguide section 302. In the first two examples, as shown in FIGs. 3B and 3C, a multi-layer waveguide structure is formed, with the second waveguide section 302 being in a plane (or layer) which is parallel to, but spaced from, the plane (or layer) of the first and third waveguide sections 301, 303. Light is coupled vertically from the end of the first waveguide section 301 and into the second waveguide section 302 (i.e. into a proximate end of the second waveguide section 302) and then coupled vertically from the other end of the second waveguide section 302 and into the third waveguide section 303 (i.e. into a proximate end of the third waveguide section 303).

[0050] To improve the efficiency of the vertical coupling, the waveguide sections may overlap by a small amount (i.e. the first and second waveguide sections overlap by a small amount and the second and third waveguide sections overlap by a small amount), as shown in FIGs. 3B and 3C. This means that the resistive heating pad 304 may overlap the ends of the first and third waveguide sections; however, due to the reduced thermal sensitivity of the material from which the first and third waveguide sections are formed, any phase error that is introduced as a consequence of this overlap is very small.

[0051] In the first example, shown in FIG. 3B, plane of the second waveguide section 302 is further away from the resistive heating pad 304 than the plane of the first and third waveguide sections 301, 303, i.e. in the orientation shown in FIG. 3B, the plane for the first and third waveguide sections 301, 303 is above the plane of the second waveguide section 302 and below the plane of the resistive heating pad 304. In the second example, shown in FIG. 3C, the plane of the second waveguide section 302 is closer to the resistive heating pad 304 than the plane of the first and third waveguide sections 301, 303, i.e. in the orientation shown in FIG. 3C, the plane for the first and third waveguide sections 301, 303 is below both the plane of the second waveguide section 302 and that plane is, in turn, below the plane of the resistive heating pad 304.

[0052] In the third example cross-section, shown in FIG. 3D, there is not a multi-layer waveguide structure and instead all three waveguide sections 301-303 are in substantially the same plane, with light being butt-coupled between the first and second sections 301, 302 and between the second and third sections 302, 303. Dependent upon the manner in which the vertical coupling (in the examples of FIGs. 3B and 3C) is achieved, butt-coupling may be more lossy and hence the multi-layer structure of FIG.