

adhesive is pulled, through capillary forces, along the interface between the grating layer 272 and the interior ledge 265. The capillary force causes the adhesive to wick/flow along the interior ledge 265, without flowing over the portion of the grating layer 272 proximate to the optical target 270. The capillary forces pull the grating layer 272 against the interior ledge 265, thereby maintaining the grating layer 272 at a desired depth within the inset region 268. Optionally, when the adhesive represents a UV cured adhesive, UV light may be introduced at this point to cure the adhesive.

[00074] An adhesive (e.g., silicone) is introduced into the channel 266 through one or more of the inlet/outlet ports 267. For example, the inlet/outlet ports 267 at one or more corners of the channel 266 may be utilized as an inlet to introduce adhesive, while the inlet/outlet ports 267 at one or more other corners of the channel 266 form an outlet to allow air to discharge from the channel 266. As explained above, as the adhesive flows through the channel 266, and the adhesive bridges over the pockets 271. The pockets 271 later provide an air relief for shrinkage as the adhesive is cured.

[00075] Figure 2A illustrates a side sectional view of the inspection apparatus 100 of Figure 1A along line 2A-2A in Figure 1A, with the optical target 120 installed. Figure 2A illustrates the optical target 120 installed in the pocket 114, and a transparent layer, representing a grating layer 122, mounted in the inset region 118. The grating layer 122 may have different regions to be used in connection with different types of alignment operations and/or calibration tests. For example, as discussed below in connection with Figure 2D, the grating layer 122 may include one or more “tiles”, representing regions at which the objective (200 in Figure 2D) is positioned to collect information in connection with various operations. By way of example, the grating layer 122 may include one or more image quality tiles, distortion tiles, clear tiles, fiducials and the like. The objective is positioned relative to various tiles to collect information in connection with performing various tests. The grating layer 122 may also be used to monitor the uniformity and position of the excitation spatial profile. The grating layer 122 may be formed from a clear carrier substrate (e.g., glass) with various microstructures 123 provided thereon and shaped in one or more predetermined patterns. The microstructures 123 are provided in one or more tiles/areas, at which the objective is positioned in connection with corresponding calibration operations and tests. Examples of various calibration operations and tests are described below in connection with Figure 10. For example, the microstructure 123 may comprise chromium or

120 and the grating layer 122. The fringe gap 124 is small enough to avoid introducing adverse optical properties as light passes between the grating layer 122 and the optical target 120. For example, if the fringe gap 124 were made unduly large, an excessive amount of light may be lost while passing through the fringe gap 124. The fringe gap 124 avoids undue loss of light within the fringe gap 124 as the light passed between the grating layer 122 and optical target 120. For example, the fringe gap 124 may have a thickness of or between about 10 μm and about 100 μm , and, in an example, a thickness of about 30 μm (+/- 20 μm). Optionally, the fringe gap 124 may have a different thickness provided that an amount of light loss remains within a predetermined light loss limit (e.g., less than or equal to about 20% of the incoming light intensity). Optionally, the grating layer 122 and the optical target 120 may experience a controlled minimal amount of contact which may introduce small interference fringes that do not unduly affect use of the optical target 120. As mentioned above, the interference fringes may be further reduced or eliminated by including the anti-reflective coating 121 on one or both of the optical target 120 and the grating layer 122.

[00085] Optionally, an index matching fluid or index matching epoxy may be provided to fill the fringe gap 124 to reduce the potential for movement between the grating layer 122 and the optical target 120 over time. At least certain index matching epoxies may experience slight changes in color (e.g., discoloration) over time which may be undesirable in at least certain applications. Also, a potential exists that an index matching fluid may leak out of the fringe gap 124 over time. Consequently, the potential exists that, at least certain index matching fluids and/or epoxies may cause the intensity of the fluorescence emission to change over time. For example, over time the matching fluid or epoxy may slightly diminish the excitation light intensity impinging upon the optical target 120 and/or the intensity of the fluorescent emission that crosses the fringe gap 124. Accordingly, in at least certain examples, utilizing air within the fringe gap 124 may represent at least one aspect for maintaining a constant intensity of the fluorescence emitted from the inspection apparatus 100. Further, the addition of an index matching fluid or epoxy may introduce an extra step/complexity to the manufacturing process that is not otherwise present when the fringe gap 124 is filled with air.

[00086] The pocket 114 is joined with a diffusion well 130 located below the pocket 114 (distal from the objective 200, shown in Figure 2B), and below the optical target 120 when inserted in the pocket 114. The diffusion well 130 is located below the pocket 114 and is