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61/141,128 29 December 2008 (29.12.2008) US(71) Applicant (for all designated States except US): **3M INNOVATIVE PROPERTIES COMPANY** [US/US]; 3M Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US).

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Declarations under Rule 4.17:

[Continued on next page]

(54) Title: PHASE-LOCKED WEB POSITION SIGNAL USING WEB FIDUCIALS

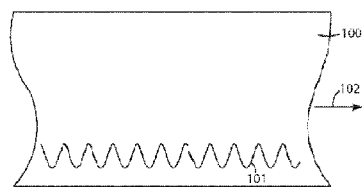


FIG. 1A

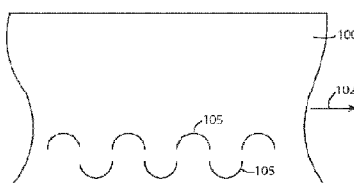


FIG. 1D

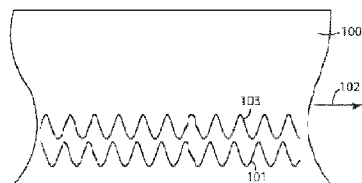


FIG. 1B

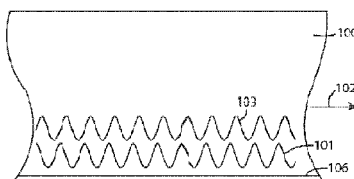


FIG. 1E

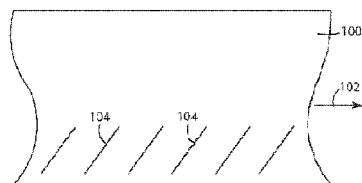


FIG. 1C

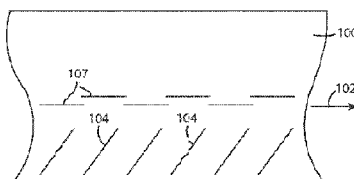


FIG. 1F

(57) Abstract: Approaches for enhancing web position determination involve phase locking a web movement encoder signal to a sensed web fiducial signal. Fiducials disposed along a longitudinal axis of a substrate are sensed and corresponding sensor signals are generated. An estimated web position is provided by one or more encoder signals. The phase difference between the sensor signals and the encoder signals is calculated and the web position error is determined based on the phase difference. The web position error signal can be fed back to adjust the encoder signals which improves the accuracy of the web position determination.



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- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))* — *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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