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recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07.

Re claim 87, providing RF bias power to a substrate (15) positioned opposite the target (Col. 5, lines 60-65). Using an specific type of filter is a matter of design choice depending on the quality of product needed, and it is obvious that the filter is going to work at certain frequencies. Furthermore, the limitation “the filter is a band rejection filter at a frequency of the bias power” is a structural limitation in a method claim, so no matter what filter is used, as long as the same result is achieved, as explained above.

Re claims 88 and 89, One of ordinary skill in the art would have been led to the recited bandwidth and frequency through routine experimentation to achieve a desired device associated characteristics and rate of sputtering.

In addition, the selection of the bandwidth and frequency, its obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA)

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(discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and *In re Aller*, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Note that the specification contains no disclosure of either the critical nature of the claimed bandwidth and frequency or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen bandwidth and frequency or upon another variable recited in a claim, the Applicant must show that the chosen bandwidth and frequency are critical. *In re Woodruf*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Claims 41, 45, 47, 49, 51, 52 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smolanoff et al. in view of Fu et al. as applied to claims 62 and 87-89 above, and further in view of Li et al. (NPL provided in this office action).

Re claim 85, The combination of Smolanoff et al. and Fu et al. does not disclose forming an oxide film by reactive sputtering in a mode between a metallic mode and a poison mode.

Li et al. disclose changing from metallic mode to poison mode (page 5, fig. 3) and while a current of oxygen is present due to RF power producing O radicals which can oxidize the target (page 6).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Smolanoff et al., Fu et al. and Li et al. to enable the oxide formation step of Li et al. to be performed in the process of Smolanoff and Fu to oxidize the target

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away from the sputtering track and therefore raises the secondary electron component of current.

Re claim 41, Li et al. disclose wherein the target is a metallic target and the process gas includes oxygen (abstract)

Re claim 45, Smolanoff et al. disclose wherein the magnetic field is provided by a moving magnetron (Col. 5, lines 39-49).

Re claim 47, Smolanoff et al. disclose wherein the process gas includes a mixture of oxygen and argon (Col. 7, lines 22-27).

Re claim 49, Smolanoff et al. disclose wherein the process gas further includes nitrogen (Col. 7, lines 25-26).

Re claim 51, Smolanoff et al. disclose further including uniformly sweeping the target with a magnetic field (Col. 6, lines 1-6).

Re claim 52, Smolanoff et al. disclose wherein sweeping the target with a magnetic field includes sweeping a magnet in one direction across the target where the magnet extends beyond the target in the opposite direction (Col. 6, lines 1-6).

Claims 42, 48 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smolanoff et al. in view of Fu et al. and Li et al. as applied to claims 41, 45, 47, 49, 51, 52 and 85 above, and further in view of Chen et al. (2004/0077161).

Re claim 42, The combination of Smolanoff et al., Fu et al. and Li et al. does not disclose wherein the target is a metallic target and the process gas includes N₂.

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Chen et al. disclose wherein the target is a metallic target and the process gas includes N₂ (Page 2, [0028] and [0030]).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Smolanoff, Fu, Li and Chen to enable the reactive gas step of the combination to be add nitrogen according to the teachings of Chen et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed reactive gas step of the combination and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07.

Re claim 46, Chen et al. disclose further including holding the temperature of the substrate substantially constant (Page 3, Paragraph [0046]).

Re claim 48, Chen et al. disclose wherein the oxygen flow is adjusted by the mass flow controllers; thereby it will adjust the index refraction of the film.

Re claim 50, Chen et al. disclose wherein providing pulsed DC power to a target includes providing pulsed DC power to a target, which has an area larger than that of the substrate (See fig. 3).

Claims 43 and 53-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smolanoff et al. in view of Fu et al. and Li et al. as applied to claims 41, 45, 47, 49, 51, 52 and 85 above, and further in view of Milonopoulou et al. (2003/0175142).

Re claim 43, the combination of Smolanoff et al., Fu et al. and Li et al. does not disclose wherein the target is a ceramic target.

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Milonopoulou et al. disclose forming a coating layer on a substrate; providing a target (12), which is ceramic (Abstract).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Smolanoff et al., Fu et al., Li et al. and Milonopoulou et al. to enable the target material of the combination to be the same according to the teachings of Milonopoulou et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable target materials of the disclosed target of the combination and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07.

Re claim 53, Milonopoulou et al. disclose wherein the target is an alloyed target (Abstract).

Re claim 54, Milonopoulou et al. disclose wherein the alloyed target includes one or more rare earth ions.

Re claim 55, Milonopoulou et al. disclose wherein the alloyed target includes Si and Al.

Re claim 56, Milonopoulou et al. disclose wherein the alloyed target includes one or more elements taken from a set consisting of Si, Al, Er and Yb.

Re claim 57, Milonopoulou et al. disclose wherein the alloyed target is a tiled target.

Re claim 58, Milonopoulou et al. disclose wherein each tiled target is formed by pre-alloy atomization and hot isostatic pressing of a powder (Page 2, Paragraph [0020]).

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