CLAIMS

1. A float bath coating system (11), comprising:

at least one nanoparticle coater (44, 64) located in a float bath (14); and

at least one vapor deposition coater (74) located downstream of the at least one nanoparticle coater,

wherein the at least one nanoparticle coater (44, 64) comprises:

a housing (46);

a nanoparticle discharge slot (48) connected to a nanoparticle source (54, 66) and a carrier fluid source (56, 67) for depositing nanoparticles (114, 120, 122) from the nanoparticle source (54, 66) directly onto a glass ribbon (30);

a first combustion slot (50) located upstream from the nanoparticle discharge slot (48), the first combustion slot (50) configured to ignite a first flame (116), wherein the first flame (116) is configured to heat a surface (32) of the glass ribbon (30); and

a second combustion slot (52) configured to ignite a second flame (118), wherein the second flame (118) is configured to heat the surface (32) of the glass ribbon (30) to smooth over the surface (32) of the glass ribbon (30) after deposition of the nanoparticles (114, 120, 122).

2. The system of claim 1, wherein the float bath (14) includes an attenuation region (40) and the at least one nanoparticle coater (44) is located upstream of the attenuation region (40).

3. The system of claim 1, wherein the float bath (14) includes an attenuation region (40) and the at least one nanoparticle coater (64) is located downstream of the attenuation region (40).

4. The system of claim 1, wherein the nanoparticle source (54) comprises a vaporizer.

5. The system of claim 1, wherein the nanoparticle source (54) comprises metal oxide nanoparticles.

6. The system of claim 1, wherein the nanoparticle source (54) comprises luminescent and/or phosphorescent nanoparticles.

7. The system of claim 6, wherein the nanoparticle source (54) comprises phosphors.

8. The system of claim 1, wherein the nanoparticle source (54) comprises luminous nanocrystalline nanoparticles.

9. The system of claim 1, wherein the first combustion slot (50) is connected to a fuel source (58, 68) and an oxidizer source (60, 70).

10. The system of claim 9, wherein the fuel source (58, 68) comprises natural gas.

11. The system of claim 10, wherein the oxidizer source (60, 70) comprises oxygen.

12. The system of claim 1, wherein the nanoparticle discharge slot (48) is located between the first combustion slot (50) and the second combustion slot (52).

13. The system of claim 1, including a first nanoparticle coater (44) and a second nanoparticle coater (64).

14. The system of claim 13, wherein the first nanoparticle coater (44) is connected to a first nanoparticle source (54) and the second nanoparticle (64) coater is connected to a second nanoparticle source (68).

15. The system of claim 14, wherein the first nanoparticle source (54) is different than the second nanoparticle source (68).

16. The system of claim 13, wherein the first nanoparticle coater (44) is connected to a first fuel source (58) and a first oxidizer source (60), and the second nanoparticle coater (64) is connected to a second fuel source (68) and a second oxidizer source (70).

17. The system of claim 16, wherein the first fuel source (58) is different than the second fuel source (68).

18. A float bath coating system (11), comprising:

at least one nanoparticle coater (44, 64) located in a float bath (14) wherein the at least one nanoparticle coater (44, 64) comprises a housing (46), the housing (46) including a nanoparticle discharge slot (48), a first combustion slot (50), and a second combustion slot (52) extending therethrough, wherein the nanoparticle discharge slot (48) is connected to a nanoparticle source (54, 66) and a carrier fluid source (56,67) and the nanoparticle discharge slot (48) deposits nanoparticles (114, 120, 122) from the nanoparticle source (54, 66) directly onto a glass ribbon (30), wherein the first combustion slot (50) is connected to a first fuel source (58) and a first oxidizer source (60), wherein the second combustion slot (52) is connected to a second fuel source (68) and a second oxidizer source (70), wherein the first combustion slot (50) is located upstream from the nanoparticle discharge slot (48), the first combustion slot (50) configured to form a first flame (116) directed toward the glass ribbon (30) to heat a surface (32) of the glass ribbon (30).

19. The float bath coating system of claim 18, wherein the second combustion slot (52) is configured to form a second flame (118), and wherein the second flame (118) is directed toward the glass ribbon (30) to smooth the surface (32) of the glass ribbon (30) after nanoparticles (114, 120, 122) are added to the glass ribbon (30).

20. The system of claim 19, wherein the nanoparticle discharge slot (48) is positioned between the first combustion slot (50) and the second combustion slot (52) and wherein the first combustion slot (50) and second combustion slot (52) are configured to direct the first and second flames (116, 118) toward the glass ribbon (30).