CLAIMS

WHAT IS CLAIMED IS:

1. An apparatus for conducting oral care experiments comprising:

a plate having a first major surface and a second major surface;

a handle coupled to and extending from the plate; and

at least one enamel block substrate mounted on the first major surface of the plate, wherein the plate is formed of a material selected from the group consisting of a wax material, polypropylene, thermoplastic elastomer, and a metal material.

2. The apparatus according to claim 1 wherein the plate is formed of a material that is inert with respect to saliva.

3. The apparatus according to claim 1 or 2 wherein the plate is formed of a wax material selected from the group consisting of an animal wax, a vegetable wax, a mineral wax, a petroleum wax, a synthetic wax and/or combinations thereof.

4. The apparatus according to any one of claims 1 to 3 wherein the plate is substantially flat.

5. The apparatus according to any one of claims 1 to 4 wherein the plate has a thickness of 0.15 cm to 1 cm.

6. The apparatus according to any one of claims 1 to 5 wherein the first major surface and the second major surface of the plate are substantially parallel to one another.

7. The apparatus according to any one of claims 4 to 6 wherein the plate is formed of a wax material and the handle is coupled to the second major surface of the plate by a layer of a wax material that covers at least a portion of the handle and a portion of the second major surface of the plate.

8. The apparatus according to claim 7 wherein the layer of the wax material is heated to form a unitary structure with the plate.

9. The apparatus according to any one of claims 1 to 8 wherein the enamel block substrate is selected from the group consisting of a bovine tooth, a human tooth, a porcelain tooth and a HAP disc.

10. The apparatus according to any one of claims 1 to 9 wherein the enamel block substrate comprises a front surface and a rear surface, and wherein the enamel block substrate is mounted to the first major surface of the plate by providing a mass of a heated wax material to the rear surface of the enamel block substrate and pressing the enamel block substrate against the first major surface of the plate, the mass of heated wax material bonding the enamel block substrate to the first major surface of the plate.

11. The apparatus according to any one of claims 1 to 9 wherein the enamel block substrate is mounted by positioning the enamel block substrate against the first major surface of the plate, heating the plate to soften a portion of the plate adjacent a perimetric edge of the enamel block substrate, and applying pressure to the enamel block substrate to at least partially embed the enamel block substrate in the first major surface of the plate.

12. The apparatus according to any one of claims 1 to 11 further comprising a retaining wall protruding from the first major surface and substantially surrounding a perimetric edge of the enamel block substrate.

13. The apparatus according to any one of claims 1 to 12 wherein a plurality of enamel block substrates are mounted on the first major surface of the plate and arranged in an array.

14. The apparatus according to claim 13 wherein the array is a three by two array.

15. The apparatus according to claim 13 wherein the array is a four by three array.

16. The apparatus according to any one of claims 1 to 15 wherein the handle is an elongated handle.

17. The apparatus according to claim 16 wherein the handle is an elongated rod-like structure.

18. The apparatus according to any one of claims 1 to 17 wherein the handle comprises a rigid core and a coating of wax material.

19. The apparatus according to any one of claims 2 or 4 to 18 wherein the plate is constructed of a pliable material.

20. The apparatus according to claim 19 wherein the pliable material is a heat-sensitive material that becomes more pliable upon being heated.

21. The apparatus according to any one of claims 1 to 20 wherein the apparatus is sized or shaped to fit within an oral care cavity.

22. A method of forming an apparatus for conducting oral care experiments comprising the steps of:

forming a plate having a first major surface and a second major surface;

mounting at least one enamel block substrate on the first major surface of the plate; and

coupling a handle to the plate, the handle extending from the plate, wherein the plate is formed of a material selected from the group consisting of a wax material, polypropylene, thermoplastic elastomer, and a metal material.

23. The method according to claim 22 wherein the plate is formed of a pliable material.

24. The method according to claim 23 wherein the pliable material is a heat-sensitive material that becomes more pliable upon being heated.

25. The method according to any one of claims 22 to 24 wherein the plate is formed of a material that is inert with respect to saliva.

26. The method according to claim 22 wherein the plate is formed of a wax material selected from the group consisting of an animal wax, a vegetable wax, a mineral wax, a petroleum wax, a synthetic wax and/or combinations thereof.

27. The method according to any one of claims 22 to 26 wherein the enamel block substrate comprises a front surface and a rear surface and wherein step b) comprises providing a mass of heated wax material on the rear surface of the enamel block substrate and pressing the enamel block substrate against the first major surface of the plate, the mass of heated wax material bonding the enamel block substrate to the first major surface of the plate.

28. The method according to any one of claims 22 to 26 wherein step b) comprises applying heat to soften the plate and pressing the enamel block substrate against the

first major surface of the plate to at least partially embed the enamel block substrate in the first major surface of the plate.

29. The method according to claim 22 wherein the plate is formed of a wax material, and wherein step c) comprises positioning a portion of the handle against the second major surface of the plate and overlaying a layer of a heated wax material over the portion of the handle and a portion of the second major surface of the plate.

30. The method according to any one of claims 22 to 29 wherein the handle comprises a rigid core and a coating of wax material.

31. The method according to any one of claims 22 to 30 wherein the handle is an elongated rod-like structure.

32. The method according to any one of claims 22 to 31 wherein step b) comprises mounting an X by Y array of enamel block substrates to the first major surface of the plate, wherein X is an integer equal to or greater than two and Y is an integer equal to or greater than two.

33. A method of gathering data comprising:

a) providing an apparatus comprising: a plate having a first major surface and a second major surface; a handle coupled to and extending from the plate; and at least one enamel block substrate mounted on the first major surface of the plate; wherein the plate is formed of a material selected from the group consisting of a wax material polypropylene, thermoplastic elastomer, and a metal material, and

b) collecting data from the apparatus.

34. The method according claim 33 wherein step a) comprises inserting the plate having the at least one enamel block substrate mounted thereon into the oral cavity for a predetermined period of time.

35. The method according to claim 33 wherein step a) comprises providing an oral care material to an oral cavity, and inserting the plate having the at least one enamel block substrate mounted thereon into the oral cavity for a predetermined period of time.

36. The method according to claim 33 wherein the handle is an elongate handle, and wherein step a) comprises inserting the plate having the at least one enamel block substrate mounted thereon into the oral cavity for a predetermined period of time, a portion of the elongate handle protruding from the oral cavity.

37. The method according to any one of claims 33 to 36 wherein step a) comprises mounting an X by Y array of enamel block substrates to the first major surface of the plate, wherein X is an integer equal to or greater than two and Y is an integer equal to or greater than two.

38. The method according to any one of claims 33 to 37 wherein step b) comprises evaluating the biofilm eradication efficacy of an oral care material.

CLAIMS

WHAT IS CLAIMED IS:

1. An apparatus for conducting oral care experiments comprising:

a plate having a first major surface and a second major surface;

a handle coupled to and extending from the plate; and

at least one enamel block substrate mounted on the first major surface of the plate.

2. The apparatus according to claim 1 wherein the plate is formed of a material that is inert with respect to saliva.

3. The apparatus according to claim 2 wherein the plate is formed of a material selected from the group consisting of a wax material, polypropylene, thermoplastic elastomer, and a metal material.

4. The apparatus according to claim 3 wherein the plate is formed of a wax material selected from the group consisting of an animal wax, a vegetable wax, a mineral wax, a petroleum wax, a synthetic wax and/or combinations thereof.

5. The apparatus according to any one of claims 1 to 4 wherein the plate is substantially flat.

6. The apparatus according to any one of claims 1 to 5 wherein the plate has a thickness of 0.15 cm to 1 cm.

7. The apparatus according to any one of claims 1 to 6 wherein the first major surface and the second major surface of the plate are substantially parallel to one another.

8. The apparatus according to any one of claims 5 to 7 wherein the plate is formed of a wax material and the handle is coupled to the second major surface of the plate by a layer of a wax material that covers at least a portion of the handle and a portion of the second major surface of the plate.

9. The apparatus according to claim 8 wherein the layer of the wax material is heated to form a unitary structure with the plate.

10. The apparatus according to any one of claims 1 to 9 wherein the enamel block substrate is selected from the group consisting of a bovine tooth, a human tooth, a porcelain tooth and a HAP disc.

11. The apparatus according to any one of claims 1 to 10 wherein the enamel block substrate comprises a front surface and a rear surface, and wherein the enamel block substrate is mounted to the first major surface of the plate by providing a mass of a heated wax material to the rear surface of the enamel block substrate and pressing the enamel block substrate against the first major surface of the plate, the mass of heated wax material bonding the enamel block substrate to the first major surface of the plate.

12. The apparatus according to any one of claims 1 to 10 wherein the enamel block substrate is mounted by positioning the enamel block substrate against the first major surface of the plate, heating the plate to soften a portion of the plate adjacent a perimetric edge of the enamel block substrate, and applying pressure to the enamel block substrate to at least partially embed the enamel block substrate in the first major surface of the plate.

13. The apparatus according to any one of claims 1 to 12 further comprising a retaining wall protruding from the first major surface and substantially surrounding a perimetric edge of the enamel block substrate.

14. The apparatus according to any one of claims 1 to 13 wherein a plurality of enamel block substrates are mounted on the first major surface of the plate and arranged in an array.

15. The apparatus according to claim 14 wherein the array is a three by two array.

16. The apparatus according to claim 14 wherein the array is a four by three array.

17. The apparatus according to any one of claims 1 to 16 wherein the handle is an elongated handle.

18. The apparatus according to claim 17 wherein the handle is an elongated rod-like structure.

19. The apparatus according to any one of claims 1 to 18 wherein the handle comprises a rigid core and a coating of wax material.

20. The apparatus according to any one of claims 2, 5 to 19 wherein the plate is constructed of a pliable material.

21. The apparatus according to claim 20 wherein the pliable material is a heat-sensitive material that becomes more pliable upon being heated.

22. The apparatus according to any one of claims 1 to 21 wherein the apparatus is sized or shaped to fit within an oral care cavity.

23. A method of forming an apparatus for conducting oral care experiments comprising the steps of:

forming a plate having a first major surface and a second major surface;

mounting at least one enamel block substrate on the first major surface of the plate; and

coupling a handle to the plate, the handle extending from the plate.

24. The method according to claim 23 wherein the plate is formed of a pliable material.

25. The method according to claim 24 wherein the pliable material is a heat-sensitive material that becomes more pliable upon being heated.

26. The method according to any one of claims 23 to 25 wherein the plate is formed of a material that is inert with respect to saliva.

27. The method according to claim 23 wherein the plate is formed of a material selected from the group consisting of a wax material, polypropylene, thermoplastic elastomer, and a metal material.

28. The method according to claim 23 wherein the plate is formed of a wax material selected from the group consisting of an animal wax, a vegetable wax, a mineral wax, a petroleum wax, a synthetic wax and/or combinations thereof.

29. The method according to any one of claims 23 to 28 wherein the enamel block substrate comprises a front surface and a rear surface and wherein step b) comprises providing a mass of heated wax material on the rear surface of the enamel block substrate and pressing the enamel block substrate against the first major surface of the plate, the mass

of heated wax material bonding the enamel block substrate to the first major surface of the plate.

30. The method according to any one of claims 23 to 28 wherein step b) comprises applying heat to soften the plate and pressing the enamel block substrate against the first major surface of the plate to at least partially embed the enamel block substrate in the first major surface of the plate.

31. The method according to claim 23 wherein the plate is formed of a wax material, and wherein step c) comprises positioning a portion of the handle against the second major surface of the plate and overlaying a layer of a heated wax material over the portion of the handle and a portion of the second major surface of the plate.

32. The method according to any one of claims 23 to 31 wherein the handle comprises a rigid core and a coating of wax material.

33. The method according to any one of claims 23 to 32 wherein the handle is an elongated rod-like structure.

34. The method according to any one of claims 23 to 33 wherein step b) comprises mounting an X by Y array of enamel block substrates to the first major surface of the plate, wherein X is an integer equal to or greater than two and Y is an integer equal to or greater than two.

35. A method of gathering data comprising:

a) providing an apparatus comprising: a plate having a first major surface and a second major surface; a handle coupled to and extending from the plate; and at least one enamel block substrate mounted on the first major surface of the plate; and

b) collecting data from the apparatus.

36. The method according claim 35 wherein step a) comprises inserting the plate having the at least one enamel block substrate mounted thereon into the oral cavity for a predetermined period of time.

37. The method according to claim 35 wherein step a) comprises providing an oral care material to an oral cavity, and inserting the plate having the at least one enamel block substrate mounted thereon into the oral cavity for a predetermined period of time.

38. The method according to claim 35 wherein the handle is an elongate handle, and wherein step a) comprises inserting the plate having the at least one enamel block substrate mounted thereon into the oral cavity for a predetermined period of time, a portion of the elongate handle protruding from the oral cavity.

39. The method according to any one of claims 35 to 38 wherein step a) comprises mounting an X by Y array of enamel block substrates to the first major surface of the plate, wherein X is an integer equal to or greater than two and Y is an integer equal to or greater than two.

40. The method according to any one of claims 35 to 39 wherein step b) comprises evaluating the biofilm eradication efficacy of an oral care material