The technology further contemplates compositions comprising a sealed container, *e.g.*, an ergonomic device as described above, the composition comprising a stool sample produced by the method described above, wherein the sealed container comprising the stool sample is enclosed in an enclosing holder according the technology, wherein the first engagement feature of the holder base is engaged with the mated engagement feature of the holder top. The technology further contemplates a mechanical shaker containing the composition.

In an aspect, there is provided an ergonomic device for collecting and containing a stool specimen, the device comprising: a) a bucket comprising: i) a top edge defining a top surface; ii) an interior side defining a circumferential vertical surface; iii) an exterior having a gripping feature; and iv) a first engagement portion; b) a lid comprising: i) a top comprising a gripping feature; and ii) a mated engagement portion adapted to removeably engage with said first engagement portion of said bucket; and c) a seal configured to seal the junction between said bucket and said lid when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged, said seal comprising a floating plate comprising an upper horizontal surface comprising at least one raised feature, and a bottom horizontal surface, wherein said seal is configured to travel independently of said bucket and said lid during manipulation to engage said first engagement portion and said mated engagement portion, and wherein, when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged, said upper horizontal surface of said seal is disposed toward said lid and said raised feature of the upper horizontal surface of the floating plate contacts said lid, and said bottom horizontal surface of said floating plate is essentially perpendicular to said circumferential vertical surface of said bucket.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of the present technology will become better understood with regard to the following drawings:

Figure 1 is a drawing of an embodiment of a stool specimen container, a bucket (1) having a flange (1b), gripping features (4), and a lid (2) having a central crossed gripping feature and edge gripping features.

Figure 2A is a cross-sectional side view of an embodiment of a stool specimen container showing a lid (2), seal (3) with a vertical component (3b) and bucket (1). Figure 2B is a perspective top view of an embodiment of a floating plate seal (3) having raised features (3a) and a vertical component 3(b).

Figure 3 is a drawing of an embodiment of a lid (2) and a floating plate seal (3) and an engagement portion (5).

Figure 4 is a perspective exterior view of an embodiment of a bucket (1) showing a flange (1b), gripping features (4), and an engagement portion that is a threaded portion (7).

Figure 5 is a perspective interior view of an embodiment of a bucket (1) showing a top surface (1a), gripping features (4) and an engagement portion that is a threaded portion (7). The interior of the bucket shows radially disposed ridges providing sample disruption features (1c).

Figure 6 is a drawing showing three embodiments of lids (2) having different top and edge gripping features. Figures 6A and 6C show different embodiments of crossed gripping features (4a), combined with edge gripping features (4b). Figure 6B shows a handle gripping feature.

Figure 7 is a drawing of an embodiment of a bucket (1) having a threaded engagement portion (7) and a lid (2) having a mated threaded portion (8).

CLAIMS

1. An ergonomic device for collecting and containing a stool specimen, the device comprising:

a) a bucket comprising:

i) a top edge defining a top surface;

ii) an interior side defining a circumferential vertical surface;

iii) an exterior having a gripping feature; and

iv) a first engagement portion;

b) a lid comprising:

i) a top comprising a gripping feature; and

ii) a mated engagement portion adapted to removeably engage with said first engagement portion of said bucket;

and

c) a seal configured to seal the junction between said bucket and said lid when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged,

wherein said seal is configured to travel independently of said bucket and said lid during manipulation to engage said first engagement portion and said mated engagement portion.

2. The ergonomic device of claim 1, wherein said bucket has an internal volume of at least 300 ml.

3. The ergonomic device of claim 1, wherein said bucket has an internal volume between about 300 ml and about 1400 ml.

4. The ergonomic device of claim 1, wherein said seal comprises a floating plate comprising a bottom horizontal surface, wherein when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged, said bottom horizontal surface of said floating plate is essentially perpendicular to said circumferential vertical surface of said bucket.

5. The ergonomic device of claim 4, wherein said bottom horizontal surface of said floating plate comprises a compressible seating surface configured to contact said top surface of said bucket, wherein said compressible seating surface is compressed when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged.

6. The ergonomic device of claim 4, wherein said floating plate comprises a cupped horizontal surface.

7. The ergonomic device of claim 4, wherein said bottom horizontal surface of said floating plate comprises a vertical component configured to contact the circumferential vertical surface of said bucket to form a circumferential seal with said circumferential vertical surface when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged.

8. The ergonomic device of claim 4, wherein said floating plate forms a seal between said lid and both said top surface and said circumferential vertical surface of said bucket when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged.

9. The ergonomic device of claim 4, wherein said floating plate comprises an upper horizontal surface, wherein said upper horizontal surface is disposed toward said lid when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged.

10. The ergonomic device of claim 9, wherein said upper horizontal surface of said floating plate comprises at least one raised feature, wherein said raised feature contacts said lid when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged.

11. The ergonomic device of claim 10, wherein said at least one raised feature provides substantially all of the contact between said upper horizontal surface of said floating

plate and said lid when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged.

12. The ergonomic device of claim 1 wherein manipulation to engage said first engagement portion of said bucket with said mated engagement portion of said lid comprises turning said lid with respect to said bucket.

13. The ergonomic device of claim 12, wherein manipulation to engage said first engagement portion of said bucket with said mated engagement portion of said lid comprises turning said lid with respect to said bucket no more than 180 degrees.

14. The ergonomic device of claim 12, wherein manipulation to engage said first engagement portion of said bucket with said mated engagement portion of said lid comprises turning said lid with respect to said bucket no more than 90 degrees.

15. The ergonomic device of claim 12, wherein manipulation to engage said first engagement portion of said bucket with said mated engagement portion of said lid comprises turning said lid with respect to said bucket less than 90 degrees.

16. The ergonomic device of claim 1 wherein said first engagement portion comprises a first threaded portion and said mated engagement portion comprises a mated threaded portion.

17. The ergonomic device of claim 1, further comprising an alignment feature on said lid a/or said bucket.

18. The ergonomic device of claim 17, wherein said alignment feature comprises an alignment feature on said lid, said alignment feature on said lid selected from an external skirt, a support ring, and an alignment ring.

19. The ergonomic device of claim 17, wherein said alignment feature comprises an alignment feature on said bucket, said alignment feature on said bucket selected from a guide rib and a funnel portion.

20. The ergonomic device of claim 1 wherein said first engagement portion comprises a first bayonet mount portion and said mated engagement portion comprises a mated bayonet mount portion.

21. The ergonomic device of claim 1 wherein said first engagement portion comprises a first snap portion and said mated engagement portion comprises a mated snap portion.

22. The ergonomic device of claim 1 wherein said bucket comprises a second engagement portion, and wherein said lid comprises a second mated engagement portion.

23. The ergonomic device of claim 22 wherein said second engagement portion is a snap portion and said second mated engagement portion is a snap portion.

24. The ergonomic device of claim 1, wherein said gripping feature on said lid is a crossed gripping feature.

25. The ergonomic device of claim 1, wherein said lid and/or the bucket comprise one or more markings instructing a user in the manipulation required to engage an engagement portion of said bucket with a mated engagement portion of said lid.

26. The ergonomic device of claim 25, wherein said markings comprise symbols and/or text.

27. The ergonomic device of claim 1, wherein said bucket comprises a plurality of gripping features on said exterior, wherein said plurality of gripping features are distributed around the circumference of said bucket.

28. The ergonomic device of claim 1, wherein said bucket comprises at least one sample disruption feature on said inside surface.

29. The ergonomic device of claim 28, wherein said bucket comprises a plurality of sample disruption features distributed on said inside surface.

30. The ergonomic device of claim 28 or claim 29, wherein said sample disruption features comprise a ridge and/or a bump.

31. The ergonomic device of claim 28, wherein said sample disruption feature is fixedly attached to said inside surface of said bucket.

32. The ergonomic device of claim 28, wherein said sample disruption feature is integrally formed on said inside surface of said bucket.

33. A kit comprising the ergonomic device according to claim 1.

34. The kit of claim 33, further comprising an instruction for use.

35. The kit of claim 33, further comprising storage, shipping, or protective packaging configured to enclose said ergonomic device.

36. The kit of claim 33 further comprising a buffer solution.

37. The kit of claim 36, wherein said buffer solution comprises a salt and a preservative or a stabilizing agent.

38. The kit of claim 37, wherein said stabilizing agent comprises a nucleic acid stabilizing agent

39. The kit of claim 33, further comprising a stool sampling device.

40. The kit of claim 33, further comprising bracket for mounting said bucket on or under a seat of a toilet.

41. A method for containing a stool sample, the method comprising:

A) providing an ergonomic device for collecting and containing a stool specimen by a geriatric user, the device comprising:

a) a bucket comprising:

i) a top edge defining a top surface;

ii) an interior side defining a circumferential vertical surface,

iii) an exterior having a gripping feature; and

iv) a first engagement portion;

b) a lid comprising:

i) a top comprising gripping feature; and

ii) a mated engagement portion adapted to removeably engage with said first engagement portion of said bucket;

and

c) a seal configured to seal the junction between said bucket and said lid when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged,

wherein said seal is configured to travel independently of said bucket and said lid during manipulation to engage said first engagement portion and said mated engagement portion

B) depositing a stool specimen in said bucket;

C) engaging said lid and said bucket with said seal disposed therebetween to form a sealed container comprising a stool sample, wherein said engaging comprises manipulating said bucket and said lid wherein said first engagement portion is engaged with said mated engagement portion.

42. The method of claim 41, further comprising adding a buffer solution to said bucket prior to step C).

43. The method of claim 42, wherein said buffer solution comprises a salt and a preservative or a stabilizing agent.

44. The method of claim 43, wherein said stabilizing agent comprises a nucleic acid stabilizing agent.

45. The method of claim 41, further comprising enclosing said sealed container comprising a stool sample in protective packaging.

46. The method of claim 45, further comprising delivering said protective packaging with the sealed container comprising said stool sample enclosed therein to a medical facility.

47. The method of claim 45, further comprising shipping or mailing said protective packaging with the sealed container comprising said stool sample enclosed therein.

48. A composition comprising a sealed container comprising a stool sample produced by a method of any one of claims 41-44.

49. The composition of claim 48, wherein said stool sample is from a geriatric patient.

50. An enclosing holder for an ergonomic device according to claim 1, said enclosing holder comprising:

a) a holder base comprising an interior cavity having a bottom surface and a top opening, said holder base comprising a first engagement feature;

b) a holder top comprising a mated engagement feature adapted to removeably engage with said first engagement feature of said enclosing base to form a leak-proof seal;

c) a sample adapter; and

d) a compression feature,

wherein said sample adapter and said compression feature are configured to limit or prohibit motion of a sealed ergonomic device enclosed in the enclosing holder with respect to said enclosing holder, and wherein said enclosing holder is configured for use in a mechanical shaker.

51. The enclosing holder of claim 50, wherein said cavity has a depth from said bottom surface to said top opening that is greater than the height of an ergonomic device according to claim 1.

52. The enclosing holder of claim 50, wherein said sample adapter is configured to limit rotation of said ergonomic device enclosed in said enclosing holder around a central axis of said ergonomic device.

53. The enclosing holder of claim 50, wherein said sample adapter is fitted to a gripping feature on the exterior of said sealed ergonomic device.

54. The enclosing holder of claim 53 wherein said gripping feature is on said bucket of said sealed ergonomic device.

55. The enclosing holder of claim 50, wherein said compression feature is configured to limit motion of said ergonomic device enclosed in said enclosing holder along a central axis of said ergonomic device.

56. The enclosing holder of claim 50, wherein said compression feature comprises a compression spring.

57. The enclosing holder of claim 56, wherein said compression spring is disposed between the bottom surface of said holder base and said sample adapter.

58. The enclosing holder of claim 50, wherein said holder base and/or said holder top are composed of metal.

59. The enclosing holder of claim 58, wherein said holder base and/or said holder top comprise steel.

60. The enclosing holder of claim 50, wherein manipulation to engage said first engagement feature of said holder base with said mated engagement feature of said holder top comprises turning said holder top with respect to said holder base.

61. The enclosing holder of claim 60, wherein said first engagement feature and said mated engagement feature comprise flange features.

62. The enclosing holder of claim 60, wherein manipulation to engage said first engagement feature of said holder base with said mated engagement feature of said holder top comprises turning said holder top with respect to said holder base no more than 45 degrees.

63. The enclosing holder of claim 60, wherein manipulation to engage said first engagement feature of said holder base with said mated engagement feature of said holder top comprises turning said holder top with respect to said holder base no more than 30 degrees.

64. The enclosing holder of claim 50, comprising a holder top assembly comprising said holder top and a gasket, wherein when said first engagement feature of said holder base is engaged with said mated engagement feature of said holder top, said gasket is disposed between said holder top and said holder base.

65. The enclosing holder of claim 64, wherein said holder top assembly comprises a gasket holder holding said gasket, wherein said holder top in said holder top assembly is configured to travel independently of said gasket holder during manipulation to engage said first engagement feature of said holder base with said mated engagement feature of said holder top.

66. The enclosing holder of claim 65, wherein said gasket holder comprises a lid-engaging feature configured to engage a gripping feature a lid on an ergonomic device enclosed in the enclosing holder.

67. The enclosing holder of claim 64, wherein said holder top assembly further comprises a handle, wherein rotation of said handle rotates said holder top to engage said first engagement feature of said holder base with said mated engagement feature of said holder top, or to disengage said first engagement feature of said holder base from said mated engagement feature of said holder top.

68. The enclosing holder of claim 67, said holder top assembly further comprising a reversible locking mechanism, wherein in a locked configuration, said locking mechanism

prevents rotation of said handle to disengage said first engagement feature of said holder base with said mated engagement feature of said holder top.

69. A method of processing a stool sample, comprising:

i) providing a sealed container comprising a stool sample produced by the method of claim 42;

ii) enclosing said sealed container in an enclosing holder according to claim 47, wherein said first engagement feature of said holder base is engaged with said mated engagement feature of said holder top;

iii) after step ii), shaking said enclosing holder in a mechanical shaker, wherein said stool sample is dispersed in buffer within said sealed container.

70. A composition comprising a sealed container comprising a stool sample produced by the method of any one of claims 42-44, wherein said sealed container comprising a stool sample is enclosed in an enclosing holder according to claim 50, wherein said first engagement feature of said holder base is engaged with said mated engagement feature of said holder top.

71. A mechanical shaker containing the composition of claim 70.

CLAIMS

1. An ergonomic device for collecting and containing a stool specimen, the device comprising:

a) a bucket comprising:

i) a top edge defining a top surface;

ii) an interior side defining a circumferential vertical surface;

iii) an exterior having a gripping feature; and

iv) a first engagement portion;

b) a lid comprising:

i) a top comprising a gripping feature; and

ii) a mated engagement portion adapted to removeably engage with said first engagement portion of said bucket;

and

c) a seal configured to seal the junction between said bucket and said lid when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged, said seal comprising a floating plate comprising an upper horizontal surface comprising at least one raised feature, and a bottom horizontal surface,

wherein said seal is configured to travel independently of said bucket and said lid during manipulation to engage said first engagement portion and said mated engagement portion, and wherein, when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged, said upper horizontal surface of said seal is disposed toward said lid and said raised feature of the upper horizontal surface of the floating plate contacts said lid, and said bottom horizontal surface of said floating plate is essentially perpendicular to said circumferential vertical surface of said bucket.

2. The ergonomic device of claim 1, wherein said bucket has an internal volume of at least 300 ml.

3. The ergonomic device of claim 1, wherein said bucket has an internal volume between about 300 ml and about 1400 ml.

4. The ergonomic device of claim 1, wherein said bottom horizontal surface of said floating plate comprises a compressible seating surface configured to contact said top surface of said bucket, wherein said compressible seating surface is compressed when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged.

5. The ergonomic device of claim 1, wherein said floating plate forms a seal between said lid and both said top surface and said circumferential vertical surface of said bucket when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged.

6. The ergonomic device of claim 1 or 5, wherein said bottom horizontal surface of said floating plate comprises a vertical component configured to contact the circumferential vertical surface of said bucket to form a circumferential seal with said circumferential vertical surface when said first engagement portion of said bucket and said mated engagement portion of said lid are engaged.

7. The ergonomic device of claim 1 wherein manipulation to engage said first engagement portion of said bucket with said mated engagement portion of said lid comprises turning said lid with respect to said bucket.

8. The ergonomic device of claim 7, wherein manipulation to engage said first engagement portion of said bucket with said mated engagement portion of said lid comprises turning said lid with respect to said bucket no more than 180 degrees, preferably no more than 90 degrees.

9. The ergonomic device of claim 1, wherein said bucket comprises at least one sample disruption feature on said inside surface.

10. The ergonomic device according to any one of claims 1-9, further comprising a stool sample disposed in said bucket, wherein said first engagement portion of said bucket and said mated engagement portion of said lid are engaged to form a sealed container containing said stool sample.

11. The ergonomic device of claim 10, wherein said sealed container further contains a buffer solution, preferably a buffer solution comprising a salt and/or a preservative or a stabilizing agent.

12. The ergonomic device according to any one of claims 1-11, wherein said ergonomic device is enclosed within an enclosing holder comprising:

a) a holder base comprising an interior cavity having a bottom surface and a top opening, said holder base comprising a first engagement feature;

b) a holder top comprising a mated engagement feature adapted to removeably engage with said first engagement feature of said enclosing base to form a leak-proof seal;

c) a sample adapter; and

d) a compression feature,

wherein said sample adapter and said compression feature are configured to limit or prohibit motion of a sealed ergonomic device enclosed in the enclosing holder with respect to said enclosing holder, and wherein said enclosing holder is configured for use in a mechanical shaker.

13. A kit comprising the ergonomic device according to any one of claims 1-9 and further comprising one or more components selected from the group consisting of an instruction for use; storage, shipping, or protective packaging configured to enclose said ergonomic device; a buffer solution; a stool sampling device; and a bracket for mounting said bucket on or under a toilet seat.

14. The kit of claim 13, wherein said buffer solution comprises a salt and a preservative or stabilizing agent.

15. The kit of claim 13, wherein said stabilizing agent comprises a nucleic acid stabilizing agent.