Claims

What we claim:

1. A device for conducting immunoassays comprising a holder formed of a material selected from the group consisting of plastic and paper, the holder having a top portion and a bottom portion, each top and bottom portion having an outer edge, a top surface and a bottom surface and a thickness between the top and bottom surfaces, at least one of the portions has a solid portion inward of the outer edge, at least the top portion has an opening inward of the outer edge, a porous support formed on the top surface of the bottom portion and a flow distributor formed on a lower surface of the top portion which distributor covers the opening of the top portion, wherein the first and second portions are releasably secured to each other when the top and bottom portions of the holder are aligned such that the bottom surface of the top portion and the top surface of the bottom portion are aligned and arranged adjacent each other to bring the top and bottom portions together.

2. The device of claim 1, comprising a sealing material formed outwardly and circumscribing the porous support opening to releasably secure said first and second portions to each other.

3. The device of claim 1 wherein the top and bottom portion of the holder are made of one piece of material and the holder has a fold running a width of the holder to form a first portion and second portion.

4. The device of claim 1 wherein the fold is a hinge.

5. The device of claim 1 wherein the flow distributor has a lower and an upper surface and the upper surface of the flow distributor is attached to the bottom surface of the top portion of the holder such that the thickness of the first portion forms one or more wells on the upper surface of the flow distributor.

6. The device of claim 1 wherein the opening of the top portion is centrally located within the outer edge of the top portion.

7. A device for conducting immunoassays comprising a holder and a carrier for the holder,

   a. the holder being formed of a material selected from the group consisting of plastic and paper, the holder has a top portion and a bottom portion, each top and bottom portion has an outer edge, a top surface and a bottom surface and a thickness between the top and bottom surfaces, at least one of the portions has a solid portion inward of the outer edge, at least the top portion has an opening inward of the outer edge, a porous support formed on the top surface of the bottom portion and a flow distributor formed on a lower surface of the top portion which distributor covers the opening of the top portion, wherein the first and second portions are releasably secured to each other when the top and bottom portions of the holder are aligned such that the bottom surface of the top portion and the top surface of the bottom portion are aligned and arranged adjacent each other to bring the top and bottom portions together; and

   b. a carrier for the holder comprised of a top plate and a bottom plate, each having a width and a length, a top and bottom surface and a thickness between the top and bottom surfaces, an outer edge and at least one opening, the plates being of a length and width greater than the length and width of the holder, the top plate of the carrier having an opening substantially equal in width and length to the opening of the top portion of the holder, the bottom surface of the top plate and the top surface of the bottom plate each having one or more seals in alignment with each other when the two plates are adjacent each other and the seals being arranged on each surface at a width and length greater than that of the opening of the top plate, but less than the outer dimensions of the holder, at least one of the plates has a seal formed adjacent the outer edge of the plate and outward of the seal of that plate.

8. The device of claim 7, further comprising means for releasably holding said top and bottom plates together.

9. The device of claim 7, wherein the seal in the top surface of the bottom plate are flange seals.

10. The device of claim 7 further comprising at least one level indicating device attached to the upper surface of the top plate.

11. The device of claim 10 wherein the level indicator is a 360 degree indicator.

12. A device of claim 7 wherein there are two level indicators, one along the length and the other along the width of the top surface of the top plate.

13. A device for conducting vacuum assisted immunoassays comprising a vacuum manifold and a holder formed of plastic or paper, the holder has a fold running a width of the holder to form a first portion and second portion, each portion has an opening that are aligned when the holder is folded closed along the fold, a porous support covers a first opening and a flow distributor covers the second opening wherein the first and second portions are releasably secured to each other when the holder is folded closed along the fold to bring the first and second portions together.

14. The device of claim 1 wherein the flow distributor is a membrane.

15. The device of claim 7 wherein the flow distributor is a membrane.

16. A device for conducting immunoassays comprising a vacuum manifold having a base, the base having an upper support surface for supporting one or more carriers that contain a holder to be processed and a drain below the support, the upper surface containing one or more central openings extending through it and the one or more central openings are in alignment with the one or more carriers.

17. The device of claim 16 wherein the base has multiple stations to position multiple carriers.

18. The device of claim 16 wherein the base has multiple stations to position multiple carriers and each carrier in each station is subdivided into two or more wells.

19. The device of claim 16 further comprising the base has one or more controls for managing and monitoring the manifold and its operation.

20. The device of claim 16 the base has multiple stations and a common pressure source for each station.

21. The device of claim 16 wherein the base has multiple stations, the base has a common pressure source for each station and each station is capable of being controlled individually.

22. The device of claim 16 wherein the holder is formed of lower porous support and an upper flow distributor and the holder is capable of holding one or more membranes between the lower support and upper flow distributor, the holder being inserted onto the upper support of the base and the cover retains the holder(s) in place on the base.

23. The device of claim 1 wherein the carrier(s) have one or more wells attached to the upper surface of the top plate.

24. The device of claim 1, wherein the carrier top plate has an opening and a lid positioned over the opening.

25. The device of claim 24, wherein said lid is made of a light blocking material.

26. The device of claim 1, wherein said carrier bottom plate has an opening and a cover releasably sealed to said opening.

27. The device of claim 1, wherein said carrier bottom plate has an opening and a valve.

28. The device of claim 27, wherein said valve is of a duck bill or umbrella configuration.

29. The device of claim 27, wherein said valve is operational by a pressure differential and is closed when no pressure differential is present across the valve.

Claims

What we claim:

1. A device for conducting immunoassays comprising a holder and a carrier for the holder,
   a. the holder being formed of a material selected from the group consisting of plastic and paper, the holder comprising a frame having a perimeter edge, the frame configured to support a flow distributor; said flow distributor comprising a membrane attached to said frame and over which a blotting membrane can be positioned; a porous support comprising polypropylene mesh bound to said frame along a portion of said perimeter edge;
   and a sheet of paper laminated to said polyproylene mesh; and
   b. a carrier for the holder comprised of a top plate and a bottom plate, each having a width and a length, a top and bottom surface and a thickness between the top and bottom surfaces, an outer edge and at least one opening, the plates being of a length and width greater than the length and width of the holder, the top plate of the carrier having an opening substantially equal in width and length to the holder, the bottom surface of the top plate and the top surface of the bottom plate each having one or more seals in alignment with each other when the two plates are adjacent each other and the seals being arranged on each surface at a width and length greater than that of the opening of the top plate, but less than the outer dimensions of the holder, at least one of the plates has a seal formed adjacent the outer edge of the plate and outward of the seal of that plate.

2. The device of claim 1, further comprising means for releasably holding said top and bottom plates together.
3. The device of claim 1 further comprising at least one level indicating device attached to the upper surface of the top plate.
4. The device of claim 3 wherein the level indicator is a 360 degree indicator.
5. A device of claim 1 wherein there are two level indicators, one along the length and the other along the width of the top surface of the top plate.
6. The device of claim 1, further comprising a vacuum manifold having a base, the base having an upper support surface for supporting said carrier that contains said holder to be processed and a drain below the support, the upper surface containing one or more central

openings extending through it and the one or more central openings are in alignment with the one or more carriers.

7. The device of claim 6 wherein the base has multiple stations to position multiple carriers.
8. The device of claim 6 wherein the base has multiple stations to position multiple carriers and each carrier in each station is subdivided into two or more wells.
9. The device of claim 6 further comprising the base has one or more controls for managing and monitoring the manifold and its operation.
10. The device of claim 6 the base has multiple stations and a common pressure source for each station.
11. The device of claim 6 wherein the base has multiple stations, the base has a common pressure source for each station and each station is capable of being controlled individually.
12. The device of claim 6 wherein the holder is capable of holding one or more membranes between said flow distributor and said porous support.
13. The device of claim 6, wherein the carrier has one or more wells attached to the upper surface of the top plate.
14. The device of claim 6, wherein the carrier top plate has an opening and a lid positioned over the opening.
15. The device of claim 14, wherein said lid is made of a light blocking material.
16. The device of claim 6, wherein said carrier has a bottom plate and an opening and a cover releasably sealed to said opening.
17. The device of claim 6, wherein said carrier has a bottom plate and an opening and a valve.
18. The device of claim 17, wherein said valve is of a duck bill or umbrella configuration.
19. The device of claim 17, wherein said valve is operational by a pressure differential and is closed when no pressure differential is present across the valve.
20. The device of claim 1, wherein the bottom surface of the top plate seal is a first flange seal, the top surface of the bottom plate seal is a second flange seal, and wherein said first and second flange seals cooperate to seal the top and bottom portions when the top and bottom portions are brought together.
21. The device of claim 20, wherein each flange seal comprises a V-shaped member.
22. The device of claim 1, wherein each flange seal is made of a flexible elastomer.