CLAIMS

What is claimed is:

1. A device, comprising:

a formed member configured to form an air-tight seal with a lactating woman's breast;

an adaptor configured to couple the formed member to a breast pump system, wherein an inner surface of the formed member is adhesive, the inner surface being sufficiently adhesive to support the weight of the formed member and the adaptor on the breast.

2. The device of claim 1, wherein the material is a soft, flexible material.

3. The device of claim 2, wherein the material is selected from silicone rubber, Styrene-Ethylene-Butylene-Styrene (SEBS), Styrene-Ethylene-Propylene-Styrene (SEPS), and Styrene-Ethylene-Ethylene-Propylene-Styrene (SEEPS) copolymers.

4. The device of claim 3, wherein the material includes a plasticizer.

5. The device of claim 4, wherein the formed member is configured to conform to the shape of a lactating woman's breast.

6. The device of claim 1, wherein the adaptor includes a passageway formed therein in fluid communication with a fluid container.

7. The device of claim 6, wherein the adaptor further includes a passageway in fluid communication with a pump.

8. The device of claim 7, wherein the adaptor further includes a diverter configured to prevent fluid from flowing into the pump.

9. The device of claim 1, wherein the formed member includes surface features configured to provide rigidity or to provide additional adhesion.

10. A breast pump system, comprising:

a breast shield including an adhesive inner surface configured to adhere to a woman's breast, the breast shield further including a opening;

an adaptor configured to mate with said breast shield via the opening in the breast shield, the adaptor being configured to communicate negative pressure to a breast covered by the breast shield; and

a fluid container coupled to the adaptor and configured such that milk expressed flows through the adaptor and into a fluid container, wherein the breast shield is configured to adhesively hold the adaptor in place during the expression of milk from a woman's breast.

11. The breast pump system of claim 10, wherein the adaptor includes a sleeve with a flared end for forming a seal against or around the areola of a woman's breast.

12. The breast pump system of claim 11, wherein the flared end of the sleeve is inserted within the opening in the breast shield, and wherein the breast shield adheres to the skin of the breast surrounding the areola.

13. The breast pump system of claim 10, wherein the breast shield is configured to adhesively connect to the breast such that no additional support is required to hold the breast shield and adaptor on a woman's breast.

14. The breast pump system of claim 10, wherein the breast shield is configured to adhesively connect to skin without application of separate adhesives to either the breast shield or a woman's breast.

15. The breast pump system of claim 10, wherein the fluid container is in fluid communication with the adaptor by tubing, and wherein the fluid container is configured to be suspended other than by the tubing.

16. The breast pump system of claim 10, wherein the breast shield is invertible to provide enhanced adherence when placed on a woman's breast.

17. The breast pump system of claim 10, wherein the system is configured such that the breast shield is removable from the adaptor for washing and reuse, or for replacement with a new breast shield.

18. The breast pump system of claim 10, wherein the breast shield includes surface features configured to provide rigidity or to provide additional adhesion.

19. The breast pump system of claim 10 wherein the fluid container is a baby bottle.

20. A breast pump system, comprising:

a breast shield;

an adaptor coupled to the breast shield;

a fluid container;

a tubing extending between the adaptor and the fluid container; and

a connector coupled to the fluid container and to the tubing, wherein the tubing is configured to communicate fluid and vacuum pressure between the adaptor and the fluid container.

21. The system of claim 20, further comprising a vacuum line coupled to the connector and configured to supply vacuum pressure to the connector, fluid container, the tubing, and the adaptor.

22. The system of claim 21, further comprising a collapsible bladder disposed in the connector such that contents of the fluid container cannot pass into the vacuum line.

23. The system of claim 20, wherein the connector includes a burp valve configured to relieve excess pressure from the fluid container.

24. The system of claim 20, further comprising a vacuum line attached to the connector to produce a pressure decrease in the fluid container to draw milk through the tubing and into the fluid container.

CLAIMS

What is claimed is:

1. A hands-free breast pump device, comprising:

a breast shield having an inner surface configured to form an air-tight seal with a lactating woman's breast surrounding the areola and an opening to receive a nipple of the breast;

an adaptor configured to couple the breast shield to a breast pump system,

a fluid container for receiving breast milk; and

an elongate flexible drain line extending between the adaptor and the fluid container and separating the breast shield and adaptor from the fluid container, wherein the fluid container is moveable independent of the breast shield and the adaptor;

wherein the inner surface of the breast shield comprises an adhesive material that adhesively attaches to the breast surrounding the areola without preventing expression of milk from the nipple through the opening of the breast shield, and that is sufficiently adhesive to adhere the breast shield to skin and support the breast shield and adaptor during the duration required to express a desired amount of milk independent of other attachment mechanisms.

2. The device of claim 1, wherein the breast shield is made of a soft, flexible material.

3. The device of claim 2, wherein the material is selected from silicone rubber, Styrene-Ethylene-Butylene-Styrene (SEBS), Styrene-Ethylene-Propylene-Styrene (SEPS), and Styrene-Ethylene-Ethylene-Propylene-Styrene (SEEPS) copolymers.

4. The device of claim 3, wherein the material includes a plasticizer.

5. The device of claim 4, wherein the material is configured in any shapes and dimensions that are compatible with the shape of a lactating woman's breast.

6. The device of claim 1, wherein the adaptor includes a passageway formed therein in fluid communication with a fluid container.

7. The device of claim 6, wherein the adaptor further includes a passageway in fluid and/or vacuum communication with a pump.

8. The device of claim 7, wherein the adaptor further includes a diverter configured to prevent fluid from flowing into the pump.

9. The device of claim 1, wherein the formed member includes surface features configured to provide rigidity or to provide additional adhesion.

10. A breast pump system, comprising:

a breast shield including an adhesive inner surface comprising an adhesive material configured to adhere to a woman's breast, the breast shield further including an opening;

an adaptor configured to mate with said breast shield via the opening in the breast shield, the adaptor being configured to communicate negative pressure to a breast covered by the breast shield; and

a fluid container coupled to the adaptor and configured such that milk expressed flows through the adaptor and into a fluid container via an elongate flexible tubing, wherein the elongate flexible drain line extends between the adaptor and the fluid container and separates the breast shield and adaptor from the fluid container, wherein the fluid container is moveable independent of the breast shield and adaptor;

wherein the adhesive material of the inner surface of the breast shield is sufficient to adhesively hold the breast shield, tubing and adaptor in place and support the weight of the breast shield, the adaptor and the elongate drain line during the expression of milk from a woman's breast without other attachment mechanisms.

11. The breast pump system of claim 10, wherein the adaptor includes a sleeve with a flared end for forming a seal against or around the areola of a woman's breast.

12. The breast pump system of claim 11, wherein the flared end of the sleeve is inserted within the opening in the breast shield, and wherein the breast shield adheres to the skin of the breast surrounding the areola.

13. The breast pump system of claim 10, wherein the breast shield is configured to adhesively adhere to a woman's breast such that no additional support is required to hold the breast shield, on a woman's breast, and supporting the breast shield, the adaptor– and elongate flexible drain line extending from the adaptor from the adhesive connection to the breast.

14. The breast pump system of claim 10, wherein the breast shield is configured to adhesively attach without application of separate adhesives to either the breast shield or a woman's breast.

15. The breast pump system of claim 10, wherein the fluid container is in fluid communication with the adaptor by tubing, and wherein the fluid container is configured to be suspended other than by the tubing.

16. The breast pump system of claim 10, wherein the breast shield is invertible to provide enhanced adherence when placed on a woman's breast.

17. The breast pump system of claim 10, wherein the system is configured such that the breast shield is removable from the adaptor for washing and reuse, or for replacement with a new breast shield.

18. The breast pump system of claim 10, wherein the breast shield includes surface features configured to provide rigidity or to provide additional adhesion.

19. The breast pump system of claim 10 wherein the fluid container is a baby bottle.

20. A breast pump system, comprising:

a breast shield having an inner surface with an opening for receiving the nipple of a breast, wherein the inner surface comprises an adhesive material;

an adaptor coupled to the breast shield;

a fluid container;

an elongate flexible drain line extending between the adaptor and the fluid container, wherein the elongate flexible drain line separates the breast shield and adaptor from the fluid container, wherein the fluid container is moveable independent of the breast shield and the adaptor; and

a connector coupled to the fluid container and to the elongate flexible drain line, wherein the elongate flexible drain line is configured to communicate fluid and vacuum pressure between the adaptor and the fluid container; and

a vacuum line attached to the connector to produce a pressure decrease in the fluid container to draw milk through the elongate flexible drain line and into the fluid container,

wherein the adhesive material of the inner surface of the breast shield is sufficiently adhesive to support the breast shield, the adaptor and the elongate flexible drain line independent of the breast pump system.

21. The system of claim 20, further comprising a collapsible bladder disposed in the connector such that contents of the fluid container cannot pass into the vacuum line.

22. The system of claim 20, wherein the connector includes a burp valve configured to relieve excess pressure from the fluid container.