

CLAIMS:

That which is claimed is:

1. A wearable system to pump fluid from a breast, the system comprising:
a skin contacting structure configured and dimensioned to form a seal with the breast;
a pump that provides a suction within the skin contacting structure;
a controller that automatically controls the operation of the pump; and
a user interface that permits manually changing a pump setting;
wherein the controller is configured to automatically provide instruction messages to a user.
2. The system of claim 1, wherein the instruction messages include education or advice concerning nursing or use of the wearable system.
3. The system of claim 1, wherein the wearable system maintains at least a latch suction throughout a pumping cycle.
4. The system of claim 1, wherein the controller is configured to control operational settings of the wearable system.
5. The system of claim 1, wherein the system includes a full indicator and an override to permit pumping after the full indicator is communicated.
6. The system of claim 1, wherein the controller is configured to adjust pumping in real time.
7. The system of claim 1, further comprising a flange and a shell, wherein the shell attaches to an exterior of the flange.

8. The system of claim 1, wherein the controller optimizes pumping by correlating pump settings with high volume outputs based on time of day, pumping patterns or a child's age, size or health.
9. The system of claim 1, wherein the controller adjusts pump settings to be correlated with the comfort and/or efficiency of the pump sessions based on feedback.
10. The system of claim 1, further comprising a flange, a chassis and a housing, wherein the flange, chassis and housing snap together.
11. The system of claim 1, wherein the controller makes pump adjustments based on analytics, and common pumping settings is tracked and identified and stored data is mined for patterns of usage and a flow profile can be created.
12. The system of claim 1, wherein the controller controls a pumping function and modifies pumping to reach targets in real time.
13. The system of claim 1, wherein the system is configured to store a variety of pump settings and to record key metrics such as time to expression, volume output, pump angle and comfort and based on such information, the system recommends specific settings for the user.
14. The system of claim 1, further comprising an inventory management system.
15. The system of claim 14, wherein the inventory management system is configured to optimize feeding amounts and both length of time of feeding and time of day based upon inventory.
16. The system of claim 1, further comprising milk containers that include a unique identifier that is associated with a specific container having a known volume and collection date, each of which are automatically collected by and stored in the system without manual work by the user.

17. The system of claim 1, further comprising a collection assembly that is placed within an interior of the system.

18. The system of claim 1, wherein use of stored milk is based upon expiration and volume.

19. The system of claim 1, wherein a new or additional storage container is suggested or automatically sent by the system such as through one or more linked commercial transaction databases.

20. The system of claim 14, wherein volume determination is employed by the inventory management system and bar codes or RFID's are incorporated into or associated with storage containers that are automatically scanned or by an operator when the storage containers are placed in or taken out of inventory.

21. The system of claim 1, wherein various sensors or scales are incorporated into inventory storage facilities or compartments to aid in controlling or keeping track of inventory.

22. The system of claim 1, further comprising a milk storage container, wherein the milk storage container includes a temperature sensor which helps in tracking when the container is place within or removed from storage, identifying the type of storage, or to ensure that the milk is being stored appropriately.

23. The system of claim 1, further comprising a container assembly, wherein container assembly include structure that is scannable or which otherwise communicates with the inventory management system via bar codes, RFID chips.

24. The system of claim 1, wherein sonar is employed to determine a volume collected in a container assembly such as by including a sonar based sensor in or near the container and

configured to facilitate assessing the volume in a container or the remaining space in a container with a known volume.

25. The system of claim 1, further comprising a laser based sensing system that facilitates assessing volume.

26. The system of claim 1, further comprising a video system configured to assess volume collected.

27. The system of claim 1, further comprising capacitance based sensors, volume sensors or thermal sensors configured within or about a storage container to facilitate assessing volumes collected in a container.

28. The system of claim 1, wherein a valve is reattached to a second or subsequent collection assembly.

29. The system of claim 1, further comprising a radio based wireless technology employed in collecting and transmitting volume data to the inventory management system.

30. The system of claim 14, wherein the inventory management system is based on first in first out inventory management.

31. The system of claim 1, further comprising a test strip that is configured to provide a scale of best or acceptable to worst or unacceptable conditions and/or provide analysis concerning the content of one or more of caffeine, alcohol, temperature, fat, and calories of collected milk.

32. The system of claim 1, further comprising a shell and pumping structure attached to an exterior of the shell.

33. The system of claim 1, further comprising a flexible flange and wherein the pump uses air or a generally incompressible fluid such as expressed milk, water or mineral oil as a medium to apply a vacuum or suction force on the flexible flange.

34. The system of claim 1, wherein a push and pull force is provided through a window in a housing connecting a space about the flange and within the housing.

35. The system of claim 1, wherein the skin contacting structure can be configured to change shape.

36. The system of claim 1, wherein the skin contacting structure includes sliding or malleable structure that can be manipulated and formed to create various sized and shaped flanges that better suit a particular user.

37. The system of claim 1, wherein the skin contacting structure is defined by piezoelectric material that can be manipulated and formed to create various sized and shaped flanges that better suit a particular user.

38. The system of claim 1, wherein the user interface permits manually changing waveform shape.

39. The system of claim 1, wherein the controller optimized pumping by correlating pump settings with high volume outputs based on correlations to a user's output profile.

40. The system of claim 1, wherein the controller optimizes pumping by correlating pump settings with high volume outputs based on real time data at the breast.

41. The system of claim 1, wherein the system includes a multi-dimensional array of different pumping profiles with preferences for portions of a pumping session based upon a first pumping period for a first child age.

42. The system of claim 1, further comprising an array of pumping profiles, wherein a pumping profile in an array of different pumping profiles is defined as a first waveform and first frequency and first suction level of a range of available levels for each of a stimulation phase and an expression phase and wherein the pumping profile is time-varying.

43. The system of claim 1, wherein a pumping profile includes a plurality of different thresholds associated with a plurality of user alerts.

44. The system of claim 1, wherein a pumping profile includes a plurality of different trigger events associated with a plurality of pump conditions.

45. The system of claim 1, wherein an array of pumping profiles is defined by one or more of a user's cohort indicator, personal preference indicator, session count, day count, session time or baby age.

46. The system of claim 1, further comprising a cloud-based data system that communicates user preferences to the pump.

47. The system of claim 1, wherein a cloud-based data system employs data mining over a population of users to set or suggest pumping parameters.

48. The system of claim 1, wherein a user scores satisfaction and the system uses satisfaction scoring to present pump profiles.

49. The system of claim 1, further comprising a feedback system taking multiple data sources into consideration to decide when and how to communicate with a user.

50. The system of claim 1, wherein a feedback system automates a user's onboarding on to the system.

51. The system of claim 1, wherein pumping, sales force support cases and web analytics data are merged to detect user issues and to provide advice regarding corrective measures.

52. The system of claim 1, wherein users requiring attention are flagged to experts who provide assistance.

53. The system of claim 1, wherein decision logic is employed to select from a plurality of firmware variants and make a recommendation to a user to switch to that firmware variant, that if accepted results in the reconfiguration of the pump to that variant.

54. The system of claim 1, wherein decision logic is employed to select from a plurality of pumping profile variants and make a recommendation to a user to switch to that profile variant, that if accepted results in the reconfiguration of the pump to that variant.