CLAIMS

What is claimed is:

1. A print liquid supply apparatus (1) to be connected to a print system, comprising

a container (3) to hold print liquid, having a first (D1), second (D2) and third (D3) dimension that are perpendicular to each other, and

an interface structure (5) to fluidically connect the container (3) to a receiving station (7) of the print system,

the interface structure (5) having a first (d1), second (d2) and third (d3) dimension parallel to said first (D1), second (D2) and third (D3) dimension of the container (3), respectively,

the interface structure (5) projecting outwards with respect to the container (3) in the direction of the respective first dimensions (D1,d1), and the first dimension (d1) of the interface structure (5) being less than half of the first dimension (D1) of the container (3), wherein

the interface structure (5) comprises

a liquid interface (15) having a seal (20) to fluidically connect to a liquid needle (9) of the receiving station (7),

a liquid channel (17) fluidically connecting the container (3) and the liquid interface (15), the liquid channel (17) and interface (15) defining a needle insertion direction (NI) approximately parallel to the second dimension (d2) of the interface (5), wherein the liquid channel (17) has a needle receiving portion (21) along which the needle (9) is to be inserted into the liquid channel (17), and

a key pen (165, 265, 365, 665D, 665E, 665F, 665G, 965) which extends next to the needle receiving portion (21) of the liquid channel (17), so that a longitudinal axis along which the key pen (165) extends is approximately parallel to a central axis (C21) of the needle receiving portion (21),

the interface structure (5) further comprising a recess (171b) housing an integrated circuit contact pad array (175) for connection to a data connector (173) of the print system, wherein contact surfaces of the pads extend in a second virtual reference plane (P8) parallel to the second (d2) and third (d3) dimensions of the interface structure, the contact pad array (175) extending along a line parallel to the third dimension (d3) of the interface structure, the contact surfaces of the contact pads facing the container (3),

the second virtual reference plane (P8) extending at a distance from a first virtual reference plane (P7) parallel to the second (d2) and third (d3) interface dimensions, the first virtual (P7) reference plane intersecting said liquid channel (17) and liquid interface (15),

so that on connection with the print system, the data connector (173) extends into the recess (171b) and between the contact surfaces of the contact pad array (175) and the container (3).

2. The print liquid supply apparatus (1) of claim 1 wherein the container (3) spans the second dimension (d2) of the interface structure (5) and projects beyond the liquid interface (15).

3. The print liquid supply apparatus (1) of claim 1 or 2 wherein the key pen is intersected by said first virtual reference plane (P7).

4. The print liquid supply apparatus (1) of any of the preceding claims comprising a pair of key pens, one at each lateral side of the liquid channel (17).

5. The print liquid supply apparatus (1) of any of the preceding claims comprising a front push area (154a) between the liquid interface (15) and the container (3), the front push area (154a) being defined by a wall portion and/or edge, the front push area (154a) being intersected by a third virtual reference plane (P5) parallel to said first (P7) and second (P8) virtual reference plane, extending on the opposite side of the liquid interface (15) with respect to the second virtual reference plane.

6. The print liquid supply apparatus (1) of any of the preceding claims wherein the interface structure (5) includes relatively flat and elongate guide surfaces (41,43) at relatively straight angles with respect to each other, elongate in a direction along the second dimension (d2) of the interface structure (5), to guide the interface structure (5) along guide surfaces of the receiving station (7).

7. The print liquid supply apparatus (1) of any of the preceding claims wherein

the interface structure (5) comprises a support wall (137a) that defines a distal side (37) facing away from the container (3), the support wall extending adjacent and generally along the second (P8) virtual reference plane, and

the support wall (137a) includes a slot adjacent the liquid interface (15) and liquid channel (17), to allow a guide rail (140A) of the receiving station (7) to extend into the distal side (37) to facilitate fluidic connection.

8. The print liquid supply apparatus (1) of any of the preceding claims wherein the container (3) has a relatively thin aspect ratio wherein the second dimension (D2) of the container (3) is at least three times greater than the third dimension (D3) of the container (3).

9. The print liquid supply apparatus (1) of any of the preceding claims wherein a third dimension (d3) of the interface structure (5) is more than two times the first dimension (d1) of the interface structure (5).

10. The print liquid supply apparatus (1) of any of the preceding claims wherein the interface structure (5) includes at least one secure feature (157) at an external lateral side (139), the secure feature (157) including a clearance (159) to allow a secure element (161) of the receiving station (7) to protrude at least partially into the clearance (159), the secure feature (157) optionally includes a stop surface (163) at an edge of the clearance (159).

11. The print liquid supply apparatus (1) of claim 10 wherein the at least one secure feature (157) at the lateral side is intersected by the first virtual reference plane (P7).

12. The print liquid supply apparatus (1) of any of the preceding claims wherein interface components of the interface structure (5) that are to interface with the receiving station (7) all extend within a contour defined by the second (D2) and third (D3) dimension of the container (3) as seen in a view direction along the first dimension (D1) of the container (3), the interface components comprising the liquid interface (15), a needle receiving portion (21) of the liquid channel (17), a front push area (154a) adjacent the liquid interface (15), a key pen (165), and integrated circuit contact pads (175).

13. The print liquid supply apparatus (11) of any of the preceding claims wherein

a fourth virtual reference plane (CP) extends parallel to the first (d1) and second (d2) dimension of the interface structure (5) approximately through a center of a third dimension (d3) of the interface structure (5) and/or container (3), and

a needle receiving liquid channel portion (21) and the liquid interface (15) are located on one side of the fourth plane (CP) and integrated circuit contact pads (175) are provided on the other side of the fourth plane (CP).

14. The print liquid supply apparatus (1) of claim 13 comprising a pair of key pens,

a first key pen of said pair extending next to the needle receiving liquid channel portion (21) at the same side of, and further away from, the fourth virtual reference plane (CP), and

a second key pen of said pair extending next to the integrated circuit control pads (175), at the same side of, and further away from, the fourth virtual reference plane (CP), wherein

the distance between the needle receiving liquid channel portion (21) and the first key pen is less than the distance between the needle receiving liquid channel portion (21) and the second key pen, and, optionally, wherein the needle receiving liquid channel portion (21) and the key pens are intersected by the first virtual reference plane (P7).

15. The print liquid supply apparatus (1) of any of the preceding claims wherein

the container (3) includes a projecting portion (123) that projects along the second dimension (D2) of the container surpassing the liquid interface (15) in a direction opposite to the needle insertion direction (NI).

16. An interface structure (5) connectable or connected to a separate liquid reservoir (33), to fluidically connect that liquid reservoir (33) to a receiving station (7) of a print system, comprising

a liquid interface (15) to fluidically connect to at least one liquid needle (9) of the receiving station (7), including an interface edge (116) and a seal (20),

a liquid channel (17), to fluidically connect the liquid interface (15) to the reservoir (33), the liquid channel (17) and interface (15) defining a needle insertion direction (NI),

key pens (165, 265, 365, 665D, 665E, 665F, 665G, 965) protruding from a base, the key pens protruding next to, approximately parallel to, and at opposite sides of, a respective needle receiving liquid channel portion (21),

a support wall (137a) supporting an integrated circuit (174) disposed between the liquid channel (17) and a first of said key pens, the support wall (137a) and integrated circuit (174) extending generally parallel to and at a distance from a first virtual reference plane (P7) intersecting the liquid channel (17) and key pens, contact surfaces of integrated circuit contact pads (175) facing the first virtual reference plane (P7), and

a front push area (154a) adjacent the liquid interface (15) at the opposite side of the liquid interface (15) with respect to the support wall (137a), wherein

the integrated circuit contact pads (175) are positioned within a recess (171b), so that an external data connector (173) of the receiving station (7) passes into the recess on connection to the receiving station between a respective needle receiving liquid channel portion (21) and the first key pen, whereby the first key pen extends at a greater distance from said needle receiving liquid

channel portion (21) than the opposite key pen.

17. The interface structure of claim 16, the front push area (154a) terminating at a front edge (154b), wherein a shortest distance (HC) between the liquid interface edge (116) and the front edge (154b) is less than the internal diameter (D116) of the liquid interface edge (116), wherein the seal (20) is seated in the liquid interface edge (116) and at least partially protrudes inside the needle receiving portion (21) of the liquid channel (17) along a central axis (C21) of the needle receiving liquid channel portion.

18. The interface structure of claim 16 or 17, having a relatively low-profile height, being

(i) defined by a distance between an external edge (137) of the support wall (137a) and the front push area edge (154b), and

(ii) less than approximately 15 mm, and, optionally, where a liquid reservoir connecting portion of the liquid channel (17) projects from the interface structure outside of the profile height.

19. The interface structure of any of claims 16 to 18 comprising a base hole (185) in a base wall (169a) from which the key pen extends, wherein

the key pen includes a base portion (183) that fits in the base hole (185) for insertion of the base portion (183) of the key pen in the base hole (185),

a circumferential edge (985a, 985b) of the base portion extends along a circumferential edge of the base hole,

the key pen protrudes from the base portion offset from its center so that it protrudes adjacent one side of the circumferential edge of the base portion and more distant from an opposite side of the circumferential edge of the base portion, and

the adjacent circumferential edge is adjacent to the support wall (137a).