[0031] As shown in FIG. 2F, the attachment portion 21 includes a first tubular portion 21a and a second tubular portion 21b that protrude upward from the top plate portion 17 (on the side of the top plate portion 17 opposite to the side wall portion 18). The second tubular portion 21b is arranged around the first tubular portion 21a at a distance from the first tubular portion 21a. The first tubular portion 21a has a through hole 21e penetrating the top plate portion 17 in the up-and-down direction (thickness direction), and the through hole 21e is in communication with a lower space 20a under the through hole 21e. Alternate long and short dashed lines 151 indicate a central axis of the first tubular portion 21a and the second tubular portion 21b, and coincides with the central axis 19n of the flow path opening member 19 (see FIG. 2A). In the example shown in FIGs. 2A to 2F, the alternate long and short dashed lines 151 are orthogonal to the top plate portion 17.

[0032] On an inner surface of the first tubular portion 21a in the vicinity of an upper end, an annular groove 211 that can be fitted with a first rib 198 and a second rib 199 (see FIG. 4A) of a communication portion 19a of the flow path opening member 19 described later is formed.

[0033] As shown in FIGs. 2A and 2D to 2G, on an outer peripheral surface of the second tubular portion 21b, a pair of linear ribs 21c are formed. The pair of linear ribs 21c are symmetrical with respect to the central axis 151 of the second tubular portion 21b. The longitudinal direction of each of the linear ribs 21c coincides with the direction of the central axis of the second tubular portion 21b. As shown in FIGs. 2F and 2G, on an inner peripheral surface of a second cylindrical portion 19c of the flow path opening member 19 described below, a pair of linear grooves 190a are formed to receive the pair of linear ribs 21c slidably. Each of the linear grooves 190a receives a part of each of the linear ribs 21c. This prevents the flow path opening member 19 from being rotated around its central axis 19n (see FIG. 2A). Consequently, it is easy to perform rotation for fitting a lock protrusion 197 (see FIGs. 2D, 2E) into a lock concave portion 321g (see FIG. 5A) of a connector 25 of a liquid-delivery circuit 27 (see FIG. 5A etc.) described later and for engaging the claw portion 19e and an engagement wall 321d of the connector 25.

[0034] The pair of linear ribs 21c and the pair of linear grooves 190a also function as a guide for the flow path opening member 19 to move toward the top plate portion 17.

portion 19d. In addition to that, in the second attachment state, the inner peripheral surface of the first cylindrical portion 19b comes into intimate contact with the outer peripheral surface of the first tubular portion 21a. Consequently, the flow path opening member 19 is constituted so that the liquid material does not leak from any part other than a flow path 211e (see FIG. ~~3e~~3B) of the communication portion 19a of the flow path opening member 19 even when the thin film 16 is broken by a piercing portion 194 of the communication portion 19a, allowing the liquid material filled in the container main body portion 11 (see FIG. 1) to flow toward the flow path opening member 19.

[0043] As shown in FIG. 3A, the communication portion 19a includes a protruding portion 191 at an end on a side opposite to the piercing portion 194. The protruding portion 191 has a circular planer shape and protrudes upward relative to the upper surface portion 19d (i.e., the upper surface portion 19d on a side opposite to the first cylindrical portion 19b) so as to be inserted into the connector 25 described later (see FIG. 4A etc.). The protruding portion 191 includes a plurality of through holes 192 formed to penetrate the protruding portion 191 in its thickness direction.

[0044] Further, as shown in FIG. 3A, the communication portion 19a includes, below the protruding portion 191 (at the side closer to the thin film 16) (see FIG. 2F etc.), a plurality of partition walls 193 that partition a space (through hole 21e) on the thin film 16 side into a plurality of regions. The partition walls 193 are arranged so as to divide the space (through hole 21e) in the direction of an extension of the respective through holes 192. Consequently, when the flow path opening member 19 is pressed toward the thin film 16 side by the connector 25 for the purpose of connecting the connector 25 of the liquid-delivery circuit 27 (see FIG. 4A etc.) to the medical port 13 thereby allowing the piercing portion 194 to pierce the thin film 16, a plurality of spaces 196 that are formed due to the presence of the plurality of partition walls 193 and are open with respect to a space 20a of the port main body portion 22 (base 20) and the plurality of through holes 192 (see FIG. 3B) function as a plurality of flow paths 211e (see FIG. 3B) through which the liquid material filled in the container main body portion 11 can flow out of the nutrient container in the direction of an arrow X (see FIG. 3A). The flow path opening member 19 shown in FIGs. 3A and 3B includes the four partition walls 193 and accordingly provides four flow paths. The

of the connector 25 to be connected to the medical port of the present invention. FIG. 5B is a plan view of the connector 25 shown in FIG. 5A. FIG. 5C is a bottom view of the connector 25 shown in FIG. 5A. FIG. 5D is a side view of the connector 25 shown in FIG. 5A. And FIG. 5E is another side view of the connector 25 shown in FIG. ~~6A~~5A.

[0051] As shown in FIGs. 5A to 5E, the female connector 25 includes an insertion portion 33, a liquid-delivery tube connecting portion 30, brim portions 32, and holding portions 31. When being connected to the medical port 13 secured to a mouth portion 12 of the container main body portion 11, the connector 25 allows the inside of the container main body portion 11 to communicate with a lumen of a flexible liquid-delivery tube 26 (see FIGs. 4A to 4C etc.) connected to the connector 25. The alternate long and short dashed lines 150 indicate central axes of the insertion portion 33 and the liquid-delivery tube connecting portion 30, which coincide with a central axis 151 of the first tubular portion 21a and the central axis 19n of the flow path opening member 19 in a state where the connector 25 is connected to the medical port 13. The direction of the central axis 150 in FIG. 5A is defined as an up-and-down direction, and an upper side on the drawing surface (side to be connected to the medical port) of FIG. 5A is referred to as an "upper side" and a lower side on the drawing surface is referred to as a "lower side".

[0052] The connector 25 has a substantially cylindrical shape as a whole. The insertion portion 33 in the vicinity of an upper end of the connector 25 has a large-diameter portion 33a with an inner diameter equal to or slightly smaller than a maximum outer diameter of the protruding portion 191 (see FIG. 3A etc.) of the medical port 13, and a small-diameter portion 33b with an inner diameter smaller than an outer diameter of the protruding portion 191 (see FIG. 4A etc.) of the flow path opening portion 19 and the inner diameter of the large-diameter portion 33a, on a lower side relative to the large-diameter portion 33a. Since the inner diameter of the large-diameter portion 33a is equal to or slightly smaller than the maximum outer diameter of the protruding portion 191, an outer peripheral surface of the protruding portion 191 comes into intimate contact with an inner peripheral surface of the large-diameter portion 33a when the protruding portion 191 of the medical port 13 is forced into the insertion portion 33 of the connector 25 so that the connector 25 and the medical port 13 are connected to each other. Thus, the medical port 13 and the

the connector 25, the first rib 198 and the annular groove 211 fitted together are released from each other, allowing the flow path opening member 19 to be forced toward the thin film 16, and the second rib 199 is fitted into the annular groove 211. Namely, due to the operation for connecting the connector 25 to the medical port 13, the flow path opening member 19 moves toward the container main body portion 11. In this state, the thin film 16 is broken by the piercing portion 194, and an inner peripheral surface of the first cylindrical ~~member~~portion 19b is in intimate contact with an outer peripheral surface of the first tubular portion 21a. Thus, the flow path opening member 19 is attached to the port main body portion 22 so that no leakage occurs (second attachment state). Further, as shown in FIG. 4D, an outer peripheral surface 191b of the protruding portion 191 comes into intimate contact with the large-diameter portion 33a of the connector 25.

[0062] As shown in FIG. 4C, as the second rib 199 is fitted into the annular groove 211, an end surface of at least one of the first cylindrical portion 19b and the second cylindrical portion 19c preferably comes into contact with the top plate portion 17. In this case, at least one of an end surface 192b of the first cylindrical portion 19b and an end surface 192c of the second cylindrical portion comes into contact with the top plate portion 17, thereby regulating the movement of the communication portion 19a. Thus, it is preferable that the second rib 199 can be fitted reliably into the annual groove 211 simply by forcing the communication portion 19a toward the thin film 16 until at least one of the end surface 192b of the first cylindrical portion 19b and the end surface 192c of the second cylindrical portion 19c comes into contact with the top plate portion 17.

[0063] Then, the connector 25 is rotated further around its central axis with respect to the medical port 13 with the holding portions 31 held. Due to the rotation of the connector 25, the lock protrusion 197 (see FIG. 2E etc.) slides over a surface 321h of the engagement wall 321d on the bridge portion 322 side while being pressed against the surface 321h and then is fitted into the lock concave portion 321g (see FIG. 5A). Due to the fitting of the lock protrusion 197 into the lock concave portion 321g, the connected state of the connector 25 with respect to the medical port 13 can be maintained stably.

[0064] Since the connector 25 includes the convex portion 321f (see FIG. 5A)

opening member 19 may have a substantially cylindrical shape and have two to four through holes 192 with its lumen divided into two to four, thereby providing two to four flow paths. In this case, the first rib 198 and the second rib 199 are formed on a surface of the communication portion 19a facing an inner peripheral surface of the first tubular portion, i.e., an outer peripheral surface of the communication portion 19a.

[0071] In the present embodiment, the medical port 13 need not include the second tubular portion 21b and the second cylindrical portion 19c.

[0072] (Embodiment 2)

Another exemplary medical port according to the present invention and another exemplary nutrient container using the medical port according to the present invention will be described with reference to FIGs. 6 to 11B.

[0073] FIG. 6 is a front view of an example of a nutrient container 10 according to the present embodiment. FIG. 7A is an enlarged perspective view showing an example of a medical port 43 of the present embodiment constituting the nutrient container shown in FIG. 6. FIG. 7B is a plan view of the medical port 43. FIG. 7C is a bottom view of the medical port 43. FIG. 7D is a side view of the medical port 43. FIG. 7E is another side view of the medical port 43. And FIG. 7F is a cross-sectional view of the medical port shown in FIG. ~~2A~~7A. FIG. 8A is a partially enlarged cross-sectional schematic view of the medical port 43, and FIG. 8B is a partially enlarged cross-sectional view of the medical port 43. FIG. 9A is a perspective cross-sectional view for explaining a flow path opening member 19 of the medical port 43, and FIG. 9B is a bottom view of the flow path opening member 19 shown in FIG. 9A.

[0074] As shown in FIGs. 6 to 8B, the medical port 43 and a nutrient container 10 of the present embodiment have the same configurations as the medical port and the nutrient container 10 of Embodiment 1 except for the maintaining structure of the flow path opening member 19 with respect to the first tubular portion 21a. The same components are denoted with the same reference numerals, and the description thereof will be omitted. Similarly, the liquid-delivery circuit 27 shown in FIG. 10B has the same structure as the liquid-delivery circuit 27 to be connected to the medical port of Embodiment 1. Although FIG. 8B is a cross-sectional view, hatching is not