CLAIMS

1. A mixing device, characterized in that the mixing device comprises:

a fixing mechanism (100), wherein the fixing mechanism (100) comprises at least one fixing assembly (110), the fixing assembly (110) comprises a fixing portion (111) configured to fix a sample container (400), and the sample container (400) has an opening (420) facing a first direction (F1); and

a force applying mechanism (200), wherein the force applying mechanism (200) is connected to the fixing mechanism (100), and the force applying mechanism (200) applies force to the fixing mechanism (100) such that the fixing mechanism (100) reciprocates in a second direction (F2), wherein the second direction (F2) is perpendicular to the first direction (F1).

2. The mixing device according to claim 1, wherein

the fixing assembly (110) comprises a first clamping portion (112) and a second clamping portion (113) arranged opposite to each other, and the first clamping portion (112) and the second clamping portion (113) are configured to be capable of approaching each other to clamp the sample container (400), and moving away from each other to release the sample container (400).

3. The mixing device according to claim 2, wherein a portion of the first clamping portion (112) configured to abut against the sample container (400) has the same shape as an outer side portion of the sample container (400), and a portion of the second clamping portion (113) configured to abut against the sample container (400) has the same shape as the outer side portion of the sample container (400).

4. The mixing device according to claim 2 or 3, wherein a portion of the first clamping portion (112) configured to abut against the sample container (400) is a flexible portion; and/or a portion of the second clamping portion (113) configured to abut against the sample container (400) is a flexible portion.

5. The mixing device according to any one of claims 1-4, wherein the fixing mechanism (100) further comprises a mounting member (120), and the at least one fixing assembly (110) is disposed on the mounting member (120).

6. The mixing device according to claim 5, wherein the mounting member (120) comprises a vertical plate structure (122) and at least one extension plate structure (124), the extension plate structure (124) is connected to the vertical plate structure (122), and the fixing assembly (110) is disposed on the extension plate structure (124).

7. The mixing device according to claim 6, wherein the extension plate structure (124) is detachably connected to the vertical plate structure (122).

8. The mixing device according to any one of claims 5-7, wherein the force applying mechanism (200) comprises:

a rotating member (210), wherein the rotating member (210) rotates about an axis extending along a third direction (F3), and the third direction (F3) is perpendicular to the first direction (F1) and the second direction (F2); and

a connecting member (220), wherein the connecting member (220) comprises opposite first and second ends, the first end being rotatably connected to the mounting member (120), and the second end being rotatably connected to the rotating member (210).

9. The mixing device according to claim 8, wherein the force applying mechanism (200) further comprises:

a first guiding member (240) and a second guiding member (250), wherein the first guiding member (240) is connected to the mounting member (120), one of the first guiding member (240) and the second guiding member (250) extends along the second direction (F2), and the first guiding member (240) cooperates with the second guiding member (250) such that the first guiding member (240) moves along the second guiding member (250).

10. The mixing device according to any one of claims 1-9, wherein

the at least one fixing assembly (110) comprises at least one group of three fixing assemblies sequentially arranged in a second direction (F2), and at least a portion of the fixing assembly (110) located in a middle of the three fixing assemblies is detachable from between the two fixing assemblies located on outer sides, such that the two fixing

assemblies located on the outer sides of the three fixing assemblies can approach each other and move away from each other.

11. The mixing device according to claim 10, wherein the mixing device further comprises a weighing mechanism (300), the weighing mechanism (300) comprises at least one receiving portion, the receiving portion is configured to receive the sample container (400), the weighing mechanism (300) is configured to weigh the sample container (400) received on each receiving portion, and the at least one receiving portion is located on a side of the fixing assembly (110) in the first direction (F1),

preferably, the at least one receiving portion comprises first receiving portions (310) corresponding one-to-one to the fixing portions (111) comprised in the three fixing assemblies, and second receiving portions (320) corresponding one-to-one to the fixing portions (111) comprised in the two fixing assemblies located on the outer sides after approaching each other,

preferably,

the first receiving portions (310) and the second receiving portions (320) are alternately arranged in a second direction (F2); and the first receiving portions (310) and the second receiving portions (320) are configured to have different shapes and/or sizes to be configured to receive different sample containers (400) respectively.

12. The mixing device according to claim 10 or 11, wherein the fixing mechanism (100) further comprises a mounting member (120), the at least one fixing assembly (110) is disposed on the mounting member (120), and the mounting member (120) has a groove (121) extending along the second direction (F2) and corresponding to at least one of the two fixing assemblies located on the outer sides of the three fixing assemblies, such that the at least one fixing assembly (110) moves along the groove (121).

13. The mixing device according to any one of claims 10-12, wherein

the fixing assembly (110) comprises a clamping body (114), and a first clamping portion (112) and a second clamping portion (113) arranged opposite to each other, the first clamping portion (112) and the second clamping portion (113) are both detachably connected to the clamping body (114), and the clamping body (114) drives the first clamping portion (112) and the second clamping portion (113) to approach each other

to clamp the sample container (400), and to move away from each other to release the sample container (400); and

the clamping body (114) of the fixing assembly (110) located in the middle of the three fixing assemblies is staggered from between the two fixing assemblies located on the outer sides, and the first clamping portion (112) and the second clamping portion (113) of the fixing assembly (110) located in the middle are disposed between the two fixing assemblies located on the outer sides.

14. The mixing device according to any one of claims 1-13, wherein the mixing device further comprises a weighing mechanism (300), the weighing mechanism (300) comprises a plurality of receiving portions, and the receiving portions are configured to receive the sample containers (400); and

the fixing mechanism (100) further comprises a driving assembly, the driving assembly is connected to the at least one fixing assembly (110), and the driving assembly is capable of driving the at least one fixing assembly (110) to move away from the plurality of receiving portions along the first direction (F1), such that the sample container (400) received in the receiving portion is detached from the receiving portion.

15. An automated mixing system, characterized in that the automated mixing system comprises a robotic arm and the mixing device according to any one of claims 1-14, the mixing device comprises a weighing mechanism (300), the weighing mechanism (300) comprises at least one receiving portion, and the receiving portion is configured to receive the sample container (400); and the robotic arm is configured to grab the sample container (400) such that the sample container (400) is detached from the receiving portion,

preferably, the sample container (400) comprises a container body (410) and a cover member, the container body (410) has the opening (420), the cover member closes the opening (420), and the robotic arm is further configured to mount the cover member on the container body (410).