the plurality of cabins is sixteen, and the sixteen cabins include: a first unpacking cabin, a second unpacking cabin, a third unpacking cabin, a fourth unpacking cabin, a first sampling cabin, a second sampling cabin, a third sampling cabin, a forth sampling cabin, a first extraction cabin, a second extraction cabin, a third extraction cabin, a fourth extraction cabin, a first amplification cabin, a second amplification cabin, a reagent preparation cabin, and the integrated unpacking and sampling cabin; the sixteen cabins form at least four testing chains: a first testing chain including the first unpacking cabin, the first sampling cabin, the first extraction cabin, and the first amplification cabin; a second testing chain including the second unpacking cabin, the second sampling cabin, the second extraction cabin, and the first amplification cabin; a third testing chain including the third unpacking cabin, the third sampling cabin, the third extraction cabin, the second amplification cabin; and a fourth testing chain including the fourth unpacking cabin, the fourth sampling cabin, the fourth extraction cabin, and the second amplification cabin; the reagent preparation cabin is configured to provide extraction reagents for the first to fourth extraction cabins and provide amplification reagents for the first and second amplification cabins; and the integrated unpacking and sampling cabin is configured to supplement the first to fourth unpacking cabins and/or the first to fourth sampling cabins in quantity.

[0015] According to some embodiments of the present disclosure, a sample obtained in the sample unpacking zone is marked with a sample code, and the laboratory management system is configured to allow input of information of the sample only when the sample code is verified.

[0016] According to some embodiments of the present disclosure, the laboratory management system is a localized laboratory management system supporting a local working mode, or a cloud platform laboratory management system supporting the local working mode and a remote collaborative working mode.

[0017] According to some embodiments of the present disclosure, the laboratory management system includes: a sample center, an experimental center, an analysis center, a report center, and a statistics center. In the sample center, samples are received, registered, and added with internal tracking numbers to form a package reception registration form. The

CLAIMS

What is claimed is:

1. A testing laboratory for medical testing, comprising a plurality of cabins, the plurality of cabins forming one or more testing chains, and each of the one or more testing chains comprising:

a sample unpacking zone;

a sampling zone;

a sample extraction zone; and

a nucleic acid amplification and testing zone,

wherein, for each of the one or more testing chains, extraction reagents required by the sample extraction zone and amplification reagents required by the nucleic acid amplification and testing zone are provided by a reagent preparation zone, and

wherein a cabin quantity of the plurality of cabins is adjustable to be adapted to a testing throughput of the testing laboratory,

wherein the testing laboratory further comprises a laboratory management system configured to manage sample data in the plurality of cabins, the laboratory management system comprising:

a sample center where samples are received, registered, and added with internal tracking numbers to form a package reception registration form;

an experimental center comprising the one or more testing chains, wherein in the experimental center, sample unpacking, sampling, sample extraction, and amplification are performed and data information generated in each process is recorded;

an analysis center configured to at least analyze data in the nucleic acid amplification and testing zone;

a report center configured to generate a report of a testing result of the nucleic acid amplification and testing zone; and

a statistics center configured to statistically obtain sample testing progresses and sample testing results.

2. The testing laboratory for medical testing according to claim 1, wherein the plurality of cabins comprises an unpacking cabin, a sampling cabin, an extraction cabin,

an amplification cabin, and a reagent preparation cabin, wherein the sample unpacking zone is provided in the unpacking cabin, the sampling zone is provided in the sampling cabin, the sample extraction zone is provided in the extraction cabin, the nucleic acid amplification and testing zone is provided in the amplification cabin, and the reagent preparation zone is provided in the reagent preparation cabin.

3. The testing laboratory for medical testing according to claim 2, wherein the plurality of cabins comprises an integrated unpacking and sampling cabin, wherein the sample unpacking zone and/or the sampling zone is provided in the integrated unpacking and sampling cabin, and the integrated unpacking and sampling cabin is configured to supplement the unpacking cabin and/or the sampling cabin in quantity.

4. The testing laboratory for medical testing according to claim 3, wherein the integrated unpacking and sampling cabin selectively serves as a sample unpacking zone and/or a sampling zone depending on a sample unpacking progress and a sampling progress as recorded in the laboratory management system.

5. The testing laboratory for medical testing according to claim 3, wherein the cabin quantity of the plurality of cabins is sixteen, and the sixteen cabins comprise: a first unpacking cabin, a second unpacking cabin, a third unpacking cabin, a fourth unpacking cabin, a first sampling cabin, a second sampling cabin, a third sampling cabin, a forth sampling cabin, a first extraction cabin, a second extraction cabin, a third extraction cabin, a fourth extraction cabin, a first amplification cabin, a second amplification cabin, a reagent preparation cabin, and the integrated unpacking and sampling cabin,

wherein the sixteen cabins form at least four testing chains: a first testing chain comprising the first unpacking cabin, the first sampling cabin, the first extraction cabin, and the first amplification cabin; a second testing chain comprising the second unpacking cabin, the second sampling cabin, the second extraction cabin, and the first amplification cabin; a third testing chain comprising the third unpacking cabin, the third sampling cabin, the third extraction cabin, the second amplification cabin; and a fourth testing chain comprising the fourth unpacking cabin, the fourth sampling cabin, the fourth extraction cabin, and the second amplification cabin,

wherein the reagent preparation cabin is configured to provide extraction reagents for the first to fourth extraction cabins and provide amplification reagents for the first and

second amplification cabins, and

wherein the integrated unpacking and sampling cabin is configured to supplement the first to fourth unpacking cabins and/or the first to fourth sampling cabins in quantity.

6. The testing laboratory for medical testing according to any one of claims 1 to 5, wherein a sample obtained in the sample unpacking zone is marked with a sample code, and the laboratory management system is configured to allow input of information of the sample only when the sample code is verified.

7. The testing laboratory for medical testing according to any one of claims 1 to 6, wherein the laboratory management system is a localized laboratory management system supporting a local working mode, or a cloud platform laboratory management system supporting the local working mode and a remote collaborative working mode.

8. The testing laboratory for medical testing according to any one of claims 1 to 7, wherein the sample unpacking zone and the sampling zone are located in different cabins or in a same cabin; the sampling zone and the sample extraction zone are located in different cabins or in a same cabin; the sample extraction zone and the reagent preparation zone are located in different cabins or in a same cabin; and the nucleic acid amplification and testing zone is located in a different cabin from any other zones; and/or

among the plurality of cabins, a number of cabins corresponding zones requiring longer operation time is greater than or equal to a number of cabins corresponding zones requiring shorter operation time; and/or

the plurality of cabins is constructed as inflatable film structures, tents, containers, or any combination thereof; and/or

two adjacent cabins of the plurality of cabins are configured to transfer materials there between through a transfer unit.

9. The testing laboratory for medical testing according to any one of claims 1 to 8, further comprising a hazardous waste treatment system configured to treat medical waste generated in the plurality of cabins into non-hazardous waste.

10. The testing laboratory for medical testing according to any one of claims 1 to 9, wherein each of the plurality of cabins is a movable and fast-removable cabin.

11. The testing laboratory for medical testing according to any one of claims 1 to 10, comprising:

at least one first throughput unit each comprising three cabins of the plurality of cabins, the three cabins forming at least one of the one or more testing chains; and/or

at least one second throughput unit each comprising four cabins of the plurality of cabins, the four cabins forming at least one of the one or more testing chains; and/or

at least one third throughput unit each comprising five cabins of the plurality of cabins, the five cabins forming at least one of the one or more testing chains; and/or

at least one fourth throughput unit each comprising eight cabins of the plurality of cabins, the eight cabins forming at least one of the one or more testing chains.

12. The testing laboratory for medical testing according to claim 11, wherein the testing laboratory is provided with different testing throughputs by combining any one or more of the at least one first throughput unit, the at least one second throughput unit, the at least one third throughput unit, or the at least one fourth throughput unit.

13. The testing laboratory for medical testing according to claim 12, wherein the testing laboratory comprises one or more first throughput units, one or more second throughput units, one or more third throughput units, and one or more fourth throughput units.

14. The testing laboratory for medical testing according to any one of claims 11 to 13, wherein the three cabins in each of the at least one first throughput unit comprise a first mixing cabin, a second mixing cabin, and an amplification cabin, and wherein the sample unpacking zone and the sampling zone are provided in the first mixing cabin, the sample extraction zone and the reagent preparation zone are provided in the second mixing cabin, and the nucleic acid amplification and testing zone is provided in the amplification cabin.

15. The testing laboratory for medical testing according to any one of claims 11 to 14, wherein the four cabins in each of the at least one second throughput unit comprise a first mixing cabin, a second mixing cabin, a third mixing cabin, and an amplification cabin, wherein the sample unpacking zone and the sampling zone are provided in the first mixing cabin, the sampling zone and the sample extraction zone are provided in the second mixing cabin, the sample extraction zone and the reagent preparation zone are provided in the third mixing cabin, and the nucleic acid amplification and testing zone is provided in the amplification cabin.

16. The testing laboratory for medical testing according to any one of claims 11 to 15,

wherein the five cabins in each of the at least one third throughput unit comprise an unpacking cabin, a sampling cabin, an extraction cabin, an amplification cabin, and a reagent preparation cabin, wherein the sample unpacking zone is provided in the unpacking cabin, the sampling zone is provided in the sampling cabin, the sample extraction zone is provided in the extraction cabin, the nucleic acid amplification and testing zone is provided in the amplification cabin, and the reagent preparation zone is provided in the reagent preparation cabin; or

wherein the five cabins in each of the at least one third throughput unit comprise an unpacking cabin, a sampling cabin, an extraction cabin, an amplification cabin, and a mixing cabin, wherein the sample unpacking zone is provided in the unpacking cabin, the sampling zone is provided in the sampling cabin, the sample extraction zone is provided in the extraction cabin, the nucleic acid amplification and testing zone is provided in the amplification cabin, and the sample extraction zone and the reagent preparation zone are provided in the mixing cabin.

17. The testing laboratory for medical testing according to any one of claims 11 to 16, wherein the eight cabins in each of the at least one fourth throughput unit comprise a first unpacking cabin, a second unpacking cabin, a first sampling cabin, a second sampling cabin, a first extraction cabin, a second extraction cabin, an amplification cabin, and a reagent preparation cabin, wherein the sample unpacking zone is provided in the first unpacking cabin and the second unpacking cabin, the sampling zone is provided in the first sampling cabin and the second sampling cabin, the sample extraction zone is provided in the first extraction cabin and the second extraction cabin, the nucleic acid amplification and testing zone is provided in the amplification cabin, and the reagent preparation zone is provided in the reagent preparation cabin; or

wherein the eight cabins in each of the at least one fourth throughput unit comprise an unpacking cabin, a first sampling cabin, a second sampling cabin, a first extraction cabin, a second extraction cabin, a first amplification cabin, a second amplification cabin, and a mixing cabin, wherein the sample unpacking zone is provided in the unpacking cabin, the sampling zone is provided in the first sampling cabin and the second sampling cabin, the sample extraction zone is provided in the first extraction cabin and the second extraction cabin, the nucleic acid amplification and testing zone is provided in the first amplification

cabin and the second amplification cabin, and the sample extraction zone and the reagent preparation zone are provided in the mixing cabin.