CLAIMS:

1. A multi-flux micro-fluidic chip based on active fluid flow control, including a chip body, wherein the chip body includes a fluid inflow cavity, reaction-quantification cavities and waste liquid cavities, and the fluid inflow cavity is communicated with an external air path; characterized in that the multi-flux micro-fluidic chip based on active fluid flow control further includes a fluid path distribution cavity disposed at a middle position of the chip body; the number of the reaction-quantification cavities is two or more, and the two or more reaction-quantification cavies are distributed on two sides of the fluid path distribution cavity in rows to form a first row of reaction-quantification cavities and a second row of reaction-quantification cavities respectively; and the reaction-quantification cavities are communicated with a fluid outlet of the fluid path distribution cavity through respective fluid path branches, and a fluid inlet of the fluid path distribution cavity is communicated with a fluid outlet of the fluid inflow cavity and an external fluid path;

wherein the fluid inlet of the fluid path distribution cavity is communicated with either the fluid inflow cavity or the external fluid path through a fluid inflow mechanism; and the fluid inflow mechanism includes a sample fluid inflow passage, a sample slow flow passage, a distribution cavity fluid inflow passage, an external fluid slow flow passage and an external fluid inflow passage, wherein the sample fluid inflow passage and the external fluid inflow passage are ascending passages, the distribution cavity fluid inflow passage is a descending passage, a fluid inlet of the sample fluid inflow passage is communicated with the fluid inflow cavity through a sample delivery passage, a fluid outlet of the sample fluid inflow passage is communicated with the fluid path distribution cavity sequentially through the sample slow flow passage and the distribution cavity fluid inflow passage, a fluid inlet of the external fluid inflow passage is communicated with the external fluid path through an external fluid delivery passage, and another end of the external fluid

inflow passage is communicated with the fluid path distribution cavity sequentially through the external fluid slow flow passage and the distribution cavity fluid inflow passage.

2. The multi-flux micro-fluidic chip based on active fluid flow control according to claim 1, wherein the distribution cavity fluid inflow passage is formed by embedding a plug in a fluid inflow component groove including an isosceles triangle-shaped groove and a cylindrical outer sleeve, the isosceles triangle-shaped groove is reversely disposed, and the cylindrical outer sleeve is disposed along a center line of the isosceles triangle-shaped groove, starts from a bottom edge of the isosceles triangle-shaped groove and extends out of a vertex of the isosceles triangle-shaped groove, so that a circular fluid outflow duct of the distribution cavity fluid inflow passage is formed; the plug is provided with a cylindrical end cap matched with the cylindrical outer sleeve and symmetrically, with respect to a center line of the cylindrical end cap, provided with two oblique outer wall faces forming oblique fluid inflow passages respectively together with two equal oblique sides of the isosceles triangle-shaped groove; and one said oblique fluid inflow passage is communicated with the sample slow flow passage, and the other said oblique fluid inflow passage is communicated with the external fluid slow flow passage.

3. A multi-flux micro-fluidic chip based on active fluid flow control, including a chip body, wherein the chip body includes a fluid inflow cavity, reaction-quantification cavities and waste liquid cavities, and the fluid inflow cavity is communicated with an external air path; characterized in that the multi-flux micro-fluidic chip based on active fluid flow control further includes a fluid path distribution cavity disposed at a middle position of the chip body; the number of the reaction-quantification cavities is two or more, and the two or more reaction-quantification cavies are distributed on two sides of the fluid path distribution cavity in rows to form a first row of reaction-quantification cavities and a

second row of reaction-quantification cavities respectively; and the reaction-quantification cavities are communicated with a fluid outlet of the fluid path distribution cavity through respective fluid path branches, and a fluid inlet of the fluid path distribution cavity is communicated with a fluid outlet of the fluid inflow cavity and an external fluid path;

wherein the fluid path distribution cavity is provided with a sample fluid inlet, an external fluid inlet and a plurality of fluid outlets, wherein the sample fluid inlet of the fluid path distribution cavity is communicated with the fluid inflow cavity through the sample delivery passage, the external fluid inlet of the fluid path distribution cavity is communicated with the external fluid path through the external fluid delivery passage, and the fluid outlets of the fluid path distribution cavity are communicated with the reaction-quantification cavities through the respective fluid path branches; and the fluid path branches are symmetrically distribution on two sides of a connecting line between the sample fluid inlet and the external fluid inlet of the fluid path distribution cavity, and each said fluid path branch has a passage width and a passage length in inverse proportion.

4. A multi-flux micro-fluidic chip based on active fluid flow control, including a chip body, wherein the chip body includes a fluid inflow cavity, reaction-quantification cavities and waste liquid cavities, and the fluid inflow cavity is communicated with an external air path; characterized in that the multi-flux micro-fluidic chip based on active fluid flow control further includes a fluid path distribution cavity disposed at a middle position of the chip body; the number of the reaction-quantification cavities is two or more, and the two or more reaction-quantification cavies are distributed on two sides of the fluid path distribution cavity in rows to form a first row of reaction-quantification cavities and a second row of reaction-quantification cavities respectively; and the reaction-quantification cavities are communicated with a fluid outlet of the fluid path distribution cavity through respective fluid path branches, and a fluid inlet of the fluid path distribution cavity is

communicated with a fluid outlet of the fluid inflow cavity and an external fluid path;

wherein each said reaction-quantification cavity includes labeled antibody storage cavities and a coated antibody storage cavity, each said coated antibody storage cavity is disposed at a middle position of the corresponding reaction-quantification cavity and provided with a reaction pool fluid inflow branch and a reaction pool fluid outflow branch, and each of two sides of a connecting line between the reaction pool fluid inflow branch and the reaction pool fluid outflow branch of each said reaction-quantification cavity is provided with one said labeled antibody storage cavity.

5. A multi-flux micro-fluidic chip based on active fluid flow control, including a chip body, wherein the chip body includes a fluid inflow cavity, reaction-quantification cavities and waste liquid cavities, and the fluid inflow cavity is communicated with an external air path; characterized in that the multi-flux micro-fluidic chip based on active fluid flow control further includes a fluid path distribution cavity disposed at a middle position of the chip body; the number of the reaction-quantification cavities is two or more, and the two or more reaction-quantification cavies are distributed on two sides of the fluid path distribution cavity in rows to form a first row of reaction-quantification cavities and a second row of reaction-quantification cavities respectively; and the reaction-quantification cavities are communicated with a fluid outlet of the fluid path distribution cavity through respective fluid path branches, and a fluid inlet of the fluid path distribution cavity is communicated with a fluid outlet of the fluid inflow cavity and an external fluid path;

wherein a valve device is disposed on a micro-fluidic passage between each said reaction-quantification cavity and the corresponding waste liquid cavity and includes:

a detection mechanism used for sensing whether or not fluid flows through a valve device mounting position, a pressing mechanism and a sealing component;

the valve devices in a normally open state in the chip body automatically close to be in an interruption state when numerical values fed back by the corresponding detection mechanisms indicate that fluid flows through the corresponding valve device mounting positions;

the valve devices in the interruption state are regularly opened to be in a circulation state;

when the valve devices are in the circulation state, fluid is pushed by air flow from the air path to circulate in the valve devices;

each said sealing component is a conductive sealing ring and includes an outer sealing ring, an inner sealing film located on an inner ring of the outer sealing ring and a probe contact connected with the outer sealing ring;

each said pressing mechanism includes a pressing head located above the corresponding inner sealing film;

each said detection mechanism includes a detection probe which is in linking connection with the corresponding pressing head and located above the corresponding probe contact, and a distance from each said detection probe to the corresponding probe contact is smaller than a distance from each said pressing head to the corresponding inner sealing film;

the micro-fluidic passage at each said valve device mounting position is transversely partitioned by a micro-fluidic passage partition into a micro-valve fluid inflow section and a micro-valve fluid outflow section;

each said micro-valve fluid inflow section is provided with a fluid outlet, and each said micro-valve fluid outflow section is provided with a fluid inlet;

each said inner sealing film is capable of covering the fluid outlet of the corresponding micro-valve fluid inflow section and the fluid inlet of the corresponding micro-valve fluid outflow section at the same time and is sealed by the corresponding outer sealing ring;

when the pressing heads of the pressing mechanisms drive the detection probes to descend towards the conductive sealing rings, the pressing mechanisms stop descending when the detection probes make contact with the probe contacts, and at this moment, gaps exist between the pressing heads and the inner sealing films; when data sensed by the detection probes change, it indicates that fluid flows through the micro-fluidic passages at the valve device mounting positions, the pressing mechanisms are triggered to work to push the pressing heads to continue to descend till the pressing heads press against the inner sealing films to cover the fluid outlets of the micro-valve fluid inflow sections and the fluid inlets of the micro-valve fluid outflow sections at the same time, and the valve devices are in the interruption state at this moment; and

when gaps exist between the pressing heads of the pressing mechanisms and the inner sealing films, the valve devices are in an open state, and as the inner sealing films are deformable, it is ensured that fluid flows out from the fluid outlets of the micro-valve fluid inflow sections and flows in from the fluid inlets of the micro-valve fluid outflow sections.

6. A multi-flux micro-fluidic chip based on active fluid flow control, including a chip body, wherein the chip body includes a fluid inflow cavity, reaction-quantification cavities and waste liquid cavities, and the fluid inflow cavity is communicated with an external air path; characterized in that the multi-flux micro-fluidic chip based on active fluid flow control further includes a fluid path distribution cavity disposed at a middle position of the

chip body; the number of the reaction-quantification cavities is two or more, and the two or more reaction-quantification cavies are distributed on two sides of the fluid path distribution cavity in rows to form a first row of reaction-quantification cavities and a second row of reaction-quantification cavities respectively; and the reaction-quantification cavities are communicated with a fluid outlet of the fluid path distribution cavity through respective fluid path branches, and a fluid inlet of the fluid path distribution cavity is communicated with a fluid outlet of the fluid inflow cavity and an external fluid path;

wherein three said waste liquid cavities are separately disposed on a periphery of the chip body in a semi-enclosure mode and include a first waste liquid cavity, a second waste liquid cavity and a third waste liquid cavity, wherein the first waste liquid cavity and the second waste liquid cavity are located on two sides of the chip body, the third waste liquid cavity is communicated with the first waste liquid cavity and the second waste liquid cavity, the first waste liquid cavity is communicated with the first row of reaction-quantification cavities, and the second waste fluid cavity is communicated with the second row of reaction-quantification cavities.

7. The multi-flux micro-fluidic chip based on active fluid flow control according to claim 6, wherein the first waste liquid cavity and the second waste liquid cavity are of a same structure and each include a waste liquid pool a, a middle cover plate a covering the waste liquid pool a and an upper cover plate a covering the middle cover plate a, each said middle cover plate a has a surface facing the corresponding waste liquid pool a and provided with an absorbent paper groove a for accommodating absorbent paper as well as a surface facing the corresponding upper cover plate a and provided with a plurality of conductive sealing ring grooves distributed at intervals, and the conductive sealing rings are disposed in the conductive sealing ring grooves; each said upper cover plate a is provided with capacitance probe penetration holes and pressing mechanism head

penetration holes at positions corresponding to the conductive sealing ring grooves; a plurality of tooth-shaped flow guiding components are disposed on an inner wall face of each said waste liquid pool a at intervals, and absorbent paper positioning columns are disposed at positions close to tips of the tooth-shaped flow guiding components; and gaps between the absorbent paper positioning columns and the inner wall faces of the waste liquid pools a form air channels of the waste liquid pools a.

8. The multi-flux micro-fluidic chip based on active fluid flow control according to claim 6 or 7, wherein the third waste liquid cavity includes a waste liquid pool b, a middle cover plate b covering an open end of the waste liquid pool b and an upper cover plate b covering the middle cover plate b, wherein the middle cover plate b has a surface facing the upper cover plate b and provided with an absorbent paper assembling groove b, air outlets a are formed in a bottom of the absorbent paper assembling groove b, and air outlets b are formed in a surface, opposite to an opening of the absorbent paper assembling groove b, of the upper cover plate b in a penetration mode.

9. A multi-flux micro-fluidic chip based on active fluid flow control, including a chip body, wherein the chip body is of a three-piece structure and sequentially includes an upper chip layer, a middle chip layer and a lower chip layer from top to bottom, the lower chip layer is provided with a whole blood filter pool, reaction-quantification pools and waste liquid pools, the middle chip layer is provided with a sample inlet groove at a position corresponding to the whole blood filter pool, middle reaction pool through holes at positions corresponding to the reaction-quantification pools, and middle cover plates, used for covering open ends of the waste liquid pools, at positions corresponding to the waste liquid pools; the upper chip layer is provided with a sample inlet groove outer ring at a position corresponding to the sample inlet groove, upper reaction pool through holes at positions corresponding to the middle reaction pool through holes, and upper cover

plates at positions corresponding to the middle cover plates; characterized in that three said waste liquid pools are separately disposed on a periphery of the chip body in a semi-enclosure mode and include a first waste liquid pool and a second waste liquid pool located on two sides of the chip body and a third waste liquid pool communicated with the first waste liquid pool and the second waste liquid pool;

the lower chip layer is further provided with a fluid path distribution pool disposed at a middle position of the lower chip layer, a sample delivery branch is disposed between one end of the fluid path distribution pool and the whole blood filter pool, and an external fluid delivery branch is disposed between another end of the fluid path distribution pool and an external fluid path;

the fluid path distribution pool is communicated with either the sample delivery branch or the external fluid delivery branch through a fluid inflow mechanism; the fluid inflow mechanism includes a sample fluid inflow passage, a sample slow flow passage, a distribution cavity fluid inflow passage, an external fluid slow flow passage and an external fluid inflow passage, wherein the sample fluid inflow passage and the external fluid inflow passage are ascending passages, the distribution cavity fluid inflow passage is a descending passage, a fluid inlet of the sample fluid inflow passage is communicated with a fluid inflow cavity through the sample delivery passage, a fluid outlet of the sample fluid inflow passage is communicated with the fluid path distribution cavity sequentially through the sample slow flow passage and the distribution cavity fluid inflow passage, a fluid inlet of the external fluid inflow passage is communicated with the external fluid path through the external fluid delivery passage, and another end of the external fluid inflow passage is communicated with the fluid path distribution cavity sequentially through the external fluid slow flow passage and the distribution

cavity fluid inflow passage;

the distribution cavity fluid inflow passage is formed by embedding a plug in a fluid inflow component groove including an isosceles triangle-shaped groove and a cylindrical outer sleeve, the isosceles triangle-shaped groove is reversely disposed, and the cylindrical outer sleeve is disposed along a center line of the isosceles triangle-shaped groove, starts from a bottom edge of the isosceles triangle-shaped groove and extends out of a vertex of the isosceles triangle-shaped groove, so that a circular fluid outflow duct of the distribution cavity fluid inflow passage is formed; the plug is provided with a cylindrical end cap matched with the cylindrical outer sleeve and symmetrically, with respect to a center line of the cylindrical end cap, provided with two oblique outer wall faces forming oblique fluid inflow passages respectively together with two equal oblique sides of the isosceles triangle-shaped groove; one said oblique fluid inflow passage is communicated with the sample slow flow passage, and the other said oblique fluid inflow passage is communicated with the external fluid slow flow passage;

each of two sides of a connecting line between the sample delivery branch and the external fluid delivery branch of the fluid path distribution pool is symmetrically provided with five fluid path branches, each said fluid path branch is connected to one said reaction-quantification pool, and an anti-backflow device is disposed between each said fluid path branch and the corresponding reaction-quantification pool connected with the fluid path branch; moreover, the reaction-quantification pools on two sides of the fluid path distribution pool are disposed in rows to form a first row of reaction-quantification pools and a second row of reaction-quantification pools respectively; the first fluid pool is communicated with the first row of reaction-quantification pools, and the second waste liquid pool

is communicated with the second row of reaction-quantification pools;

the first waste liquid pool and the second waste liquid pool are of a same structure; the first waste liquid pool is provided with a middle cover plate having a surface facing the first waste liquid pool and provided with an absorbent paper groove a for accommodating absorbent paper as well as an upper cover plate having a surface facing the first waste liquid pool and provided with conductive sealing ring grooves distributed at intervals, and conductive sealing rings are disposed in the conductive sealing ring grooves; the upper cover plate of the first waste liquid pool is further provided with capacitance probe penetration holes and pressing mechanism head penetration holes at positions corresponding to the conductive sealing ring grooves;

an absorbent paper assembling groove b is formed in a surface, towards an upper cover plate of the third waste liquid pool, of a middle cover plate of the third waste liquid pool; and air holes a are formed in a bottom of the absorbent paper assembling groove b, and air outlets b are formed in a surface, opposite to an opening of the absorbent paper assembling groove b, of the upper cover plate of the third waste liquid pool in a penetration mode.