CLAIMS

1. A microfluidic detection chip for multi-channel rapid detection, comprising a chip body, a chip sampling port (7), a plurality of independent detection chambers (8), and a microfluidic channel (5) being disposed on the chip body, the chip sampling port (7) being communicated with the detection chambers (8) by means of the microfluidic channel (5), wherein the chip body further comprises an electrode (4); the detection chambers (8) are connected to the electrode(4); the microfluidic channel (5) comprises a main flow channel (501) and a plurality of branch microfluidic channels (502), a tail end of the main flow channel (501) is divided into the plurality of branch microfluidic channels (502), and the plurality of branch microfluidic channels (502) are communicated with the plurality of independent detection chambers (8) in a one-to-one correspondence manner; and the other end of the main flow channel (5) is communicated with the chip sampling port (7), wherein the chip body comprises a bottom plate layer (1), an intermediate layer (2), and an upper cover layer (3) in sequence from bottom to top; the bottom plate layer, the intermediate layer, and the upper cover layer cooperate to define a closed microfluidic channel (5) and the plurality of independent detection chambers (8) and a funnel region (9); the microfluidic channel (5) and the detection chambers (8) are located in the intermediate layer (2); a liquid injection port (701) and a plurality of exhaust holes (6) are formed on the upper cover layer (3), the plurality of exhaust holes (6) are provided on one side of the upper cover layer (3) corresponding to the tail end of the microfluidic channel (5), and the liquid injection port (701) is communicated with a front end of the microfluidic channel (5); and the electrode (4) is provided on the bottom plate layer (1), wherein the plurality of independent detection chambers (8) are distributed in a fan shape, a notch (10) is formed on one side of a lower end of the bottom plate layer (1); the liquid injection port (701), the funnel region(9), and the notch (10) are respectively formed at corresponding positions on the upper cover layer (3), the intermediate layer (2), and the bottom plate layer (1) and have different sizes; and the chip sampling port (7) is formed by the liquid injection port (701), the funnel region (9), and the notch (10) and is connected to the bottom of the detection chambers (8) by means of the microfluidic channel (5) wherein the chip sampling port (7) is set to a funnel shape with a large bottom plate area, a small upper cover area and a funneled intermediate layer.

2. The microfluidic detection chip for multi-channel rapid detection according to claim 1, wherein the liquid injection port (701), the funnel region (9), and the notch are all arc-shaped and have different radians; the liquid injection port (701) and the funnel region (9) are semicircular arc-shaped, and the radius of the funnel region (9) is not less than the arc radius of the liquid injection port (701); a curved main flow channel (501) in the funnel region is divided into a plurality of branch microfluidic channels which are communicated with the plurality of independent detection chambers in a one-to-one correspondence manner; and the area of the notch is smaller than the area of the funnel region; or
the main flow channel is a funnel region (501); the liquid injection port (701) is arc-shaped, and overlaps with a part of the funnel region (501); the funnel region is converged inward from an opening to form a horn shape; and the funnel region (9) is inwardly divided into a plurality of branch microfluidic channels at the tail end thereof.

3. The microfluidic detection chip for multi-channel rapid detection according to claim 1, wherein the bottom plate layer (1), the intermediate layer (2), and the upper cover layer (3) are integrally bonded by means of double-sided gluing of the intermediate layer.

4. The microfluidic detection chip for multi-channel rapid detection according to any one of claims 1 to 3, wherein the intermediate layer (2) is a pressure-sensitive adhesive tape; the material of the upper cover layer and/or the bottom plate layer is any one of PMMA, PP, PE, and PET; and the surfaces of the upper cover layer (3) and the bottom plate layer (1) each has a hydrophilic membrane.

5. The microfluidic detection chip for multi-channel rapid detection according to claim 4, wherein the thickness of the intermediate layer is 0.1-1.0 mm; the surface of the bottom plate layer is flat; the depth of the closed microfluidic channel defined by the bottom plate layer, the intermediate layer, and the upper cover layer that cooperate with each other is 0.1-1.0 mm and the width of the detection chambers defined is 1.0-2.0 mm.

6. The microfluidic detection chip for multi-channel rapid detection according to claim 4, wherein a nozzle is disposed at the junction of each of the branch microfluidic channels and the corresponding detection chamber, and each of the branch microfluidic channels has a corresponding electrode; each electrode comprises an input high-side electrode and an input low-side electrode, and the thickness of the electrode is 50 μm.