Claims

What is claimed is:

1.An occluder with no externally protruding structure at either end, wherein, it includes：

a mesh body, the mesh body has a first closing end and a second closing end disposed opposite to each other;

a first closing line, the first closing line passes through a plurality of grids formed by mesh filaments at the first closing end in order to implement closing of the first closing end;

a second closing line, the second closing line passes through a plurality of grids formed by mesh filaments at the second closing end in order to implement closing of the second closing end;

wherein, both the first closing end and the second closing end have no externally protruding structure, and are configured to make external surfaces of the occluder flat;

the second closing line has a circular closing line, the circular closing line passes through the plurality of grids formed by mesh filaments at the second closing end to implement closing of the second closing end, as a connector, the circular closing line connects to a conveying equipment which transports the occluder with no externally protruding structure at either end.

2.An occluder with no externally protruding structure at either end, wherein, it includes：

a mesh body, the mesh body has a first closing end and a second closing end disposed opposite to each other;

a first closing line, the first closing line passes through a plurality of grids formed by mesh filaments at the first closing end in order to implement closing of the first closing end;

a second closing line, the second closing line passes through a plurality of grids formed by mesh filaments at the second closing end in order to implement closing of the second closing end;

wherein, both the first closing end and the second closing end have no externally protruding structure, and are configured to make external surfaces of the occluder flat;

wherein, the second closing line has a circular closing line and a transporting line, the circular closing line passes through the plurality of grids formed by mesh filaments at the second closing end to implement closing of the second closing end, two ends of the transporting line are respectively connected to the circular closing line to connect with a conveying equipment which transports the occluder with no externally protruding

structure at either end.

3. The occluder with no externally protruding structure at either end according to claim 1, wherein, materials of the mesh body, the first closing line, the second closing line are all implantable materials, and are selected from at least one of the following materials:

(1) metals and their alloy materials, including stainless steels, cobalt-base alloys, titanium and titanium alloys, Ni-Ti alloy shape memory materials；

(2) nondegradable bioinert medical polymer materials, including nylon, polyethylene terephthalate, polytetrafluoroethylene, extra-high molecular weight polyethylene, high density polyethylene, polymethyl methacrylate, polypropylene, polycarbonate, polyurethane, organosilicon, polyacrylonitrile；

(3) degradable biomedical materials, including polylactic acid, polyglycolide acid, polycaprolactone, polydioxanone, and copolymer or mixture of these materials.

4. The occluder with no externally protruding structure at either end according to claim 1, wherein, the mesh body is manufactured by methods of being woven from mesh filaments or 3D printing.

5. The occluder with no externally protruding structure at either end according to claim 1, wherein, the internal of the occluder with no externally protruding structure at either end is provided with fiber fabric, non-woven fabric or membrane.

6. The occluder with no externally protruding structure at either end according to any of claims 1-5, wherein, the occluder with no externally protruding structure at either end is: an atrial septal defect occluder, a patent ductus arteriosus occluder, a ventricular septal defect occluder, a patent foramen ovale occluder, a left atrial appendage occluder or a vascular occluder.