CLAIMS

1. Elongated functional system, said system being configured to be advanced in the lumen of a pipe, a duct or a tube presenting a curvature, said elongated functional system having:

- a body part having:
  - a main elongated proximal part, and
  - a distal part, being a continuous extension of the proximal part, said distal part comprising:
    - one functional end terminating with a tip, and
    - at least one active area located upstream the functional end on the distal part, said active area being configured to switch between an initial state and an activated state with a reversible curvature; and
- at least one first actuator being connectable to a source of energy and being configured to convey or transform an amount of energy to the distal part, said amount of energy being sufficient to activate the active area in order to cause the reversible curvature of the active area, said reversible curvature being greater or equal to the curvature of the center of the tube,

wherein the active area is configured to go back in its initial state once the activation stops,

wherein the active area of the body part is further configured to be placed in the center of the tube, thereby preventing any snapping effect of the whole elongated functional system;

wherein the elongated functional system further comprises at least one second actuator configured to activate the functional end (3d), wherein the at least one first actuator and, thereby, the active area, are distant from the tip, the distance between the distal end of the tip and the distal end of the at least one first actuator being of 0.1 to 5, preferably 0.25 to 3, more preferably 0.5 to 2 times the length of the at least one first actuator.

2. Elongated functional system according to claim **1**, wherein the main elongated proximal part and/or the distal part are straight and flexible.

3. Elongated functional system according to any one of claims **1** to **2**, wherein the functional end is straight or curved by design, and flexible.

4. Elongated functional system according to any one of claims **1** to **3**, wherein the at least one first actuator, or each of the at least one first actuator and the at least one second actuator are made of, or comprise, at least one shape memory alloy or at least one polymer or at least one metal or at least one piezo-electric material.

5. Elongated functional system according to any one of claims **1** to **4**, wherein the at least one first actuator, or each of the at least one first actuator and the at least one second actuator and the body part are each independently made of shape memory alloy, preferably of nickel-titane alloy, also referred to as nitinol.

6. Elongated functional system according to any one of claims **1** to **5**, wherein the at least one first actuator and/or the at least one second actuator, each independently, contracts or curvates when stimulated by a source of energy, thereby respectively: causing the flexion or curvature of the active area to which they are fixed, and/or activating the functional end.

7. Elongated functional system according to any one of claims **1** to **6**, wherein the functional end is a steerable end.

8. Elongated functional system according to any one of claims **1** to **7**, wherein the distal part comprises at least one third actuator.

9. Elongated functional system according to any one of claims **1** to **8**, wherein the actuation of the at least one first actuator and/or the at least one second actuator generates a simple or a double or a multiple curvature of active area and/or functional end.

10. Elongated functional system according to claim **9**, wherein the simple or a double or a multiple curvature is selected in the group consisting of S-shape, a C-shape, a U-shape, L-shape, J-shape or a G-shape of whole or part of distal part.

11. Elongated functional system according to any one of claims **1** to **10**, further comprising an external control unit located at the proximal end of the main elongated proximal part, said unit comprising at least one controller device configured to actuate independently each of the at least one first actuator and the at least one second actuator.

12. Elongated functional system according to any one of claims **1** to **11**, further comprising a source of energy and means for providing energy to the at least one first actuator connected to said source of energy.

13. Elongated functional system according to any one of claims **1** to **12**, which is a catheter guide.

14. Method for stabilizing an elongated functional system advanced in the lumen of a of a pipe, a duct or a tube having at least one curve, wherein the elongated functional system has:

- a body part having a main proximal part and a distal part, said distal part being a continuous extension of the proximal part, said distal part comprising one functional end terminating with a tip, and at least one active area located upstream the functional end on the distal part; and
- at least one actuator configured to convey or transform an amount of energy to the distal part sufficient to cause a reversible curvature of the active area, greater or equal to the curvature of the center of the tube, at the location of the active area, thereby preventing undesired rotation of the whole system; the at least one actuator being connectable to a source of energy,
- the at least one actuator and, thereby, the active area, being distant from the tip, the distance between the distal end of the tip and the distal end of the at least one actuator being of 0.1 to 5, preferably 0.25 to 3, more preferably 0.5 to 2 times the length of the at least one actuator,
- optionally, the elongated functional system also comprises at least one second actuator configured to activate the functional end,

the method comprising the steps of:

- advancing the system in a curve of the tube;
- stabilizing the system by actuating the active area so that it reaches a curvature equal or greater than that of the curve of the tube;
- if a double curve has to be operated, actuating the active area through a second actuator.