CLAIMS

1. A device comprising:

   a finger body, the finger body including one or more finger cavities disposed along a length of the finger body, the length of the finger body in a default shape defining a first axis, the finger body being bendable away from the first axis in response to a change in a finger fluid pressure in the one or more finger cavities; and

   a petal, the petal being coupled to the finger body at one or more points along the length of the finger body, the petal having one or more petal cavities disposed thereon,

   wherein the petal is actively deformable and/or passively deformable in response to the bending of the finger body and/or a change in a petal fluid pressure in the one or more petal cavities,

   wherein the petal comprises at least one lateral portion, and wherein the petal is deformable by displacing the at least one lateral portion.

2. The device according to claim 1, wherein the petal is deformable between any two of a plurality of shapes.

3. The device according to claim 1 or 2, wherein the petal is deformable by a concurrent bending relative to the first axis and a change in a lateral curvature of the petal.

4. The device according to claim 3, wherein the one or more petal cavities comprises a plurality of the petal cavities distributed along one or more bellows axes, and wherein the lateral curvature is defined along the one or more bellows axes.

5. The device according to claim 4, wherein at least one of the one or more bellows axes is non-parallel to the first axis.

6. The device according to any one of claims 1 to 5, wherein the at least one lateral portion is displaceable towards a first direction in response to a negative change in the finger fluid pressure, and wherein the at least one lateral portion is displaceable towards a second direction in response to a negative change in the petal fluid pressure, the second direction opposing the first direction.

7. The device according to any one of claims 1 to 6, wherein the petal is deformable towards a scoop shape in response to the bending of the finger body and an expansion of the one or more petal cavities under a positive petal fluid pressure, the petal in the scoop shape forming a hollow in which the finger body is disposed.

8. The device according to any one of claims 1 to 7, wherein the petal is deformable towards a tubular shape in response to a contraction of the one or more petal cavities under a negative fluid pressure, the petal in the tubular shape being folded away from the finger body.

9. The device according to any one of claims 1 to 8, wherein the petal is deformable towards a default shape under an elastic bias of the finger body and/or the petal.

10. The device according to any one of claims 1 to 9, wherein the petal defines a first surface and a second surface opposing the first surface, and wherein the petal is coupled to the finger body at the first surface, and wherein the one or more petal cavities are disposed on the second surface.

11. The device according to any one of claims 1 to 10, further comprising a nail elastically coupled to the finger body, wherein the nail is resiliently displaceable along the first axis relative to the finger body.

12. The device according to any one of claims 1 to 11, further comprising a flap extending laterally from a side of the petal.

13. A gripper comprising:

a palm defining a central axis; and

a plurality of devices, each of the plurality of devices including:

a finger body, the finger body including one or more finger cavities disposed along a length of the finger body, the length of the finger body in a default shape defining a first axis, the finger body being bendable away from the first axis in response to a change in a finger fluid pressure in the one or more finger cavities; and

a petal, the petal being coupled to the finger body at one or more points along the length of the finger body, the petal having one or more petal cavities disposed thereon,

wherein the petal is deformable in response to the bending of the finger body and/or a change in a petal fluid pressure in the one or more petal cavities,

wherein the petal comprises at least one lateral portion, and wherein the petal is deformable by displacing the at least one lateral portion,

wherein each of the plurality of devices is coupled to the palm via a respective coupling independently of any other of the plurality of devices,

and wherein the respective finger body of the plurality of devices collectively define a working aperture,

and wherein the plurality of devices and the palm collectively define a workspace volume.

14. The gripper according to claim 13, wherein any one or both of the working aperture and the workspace volume is changeable in response to a deformation of any one or more of the plurality of devices.

15. The gripper according to claim 13 or claim 14, further comprising a palm cavity operable by a palm fluid pressure, wherein the plurality of the devices are displaceable towards or away from one another in correspondence with a radial displacement of the respective coupling relative to the central axis, the radial displacement being responsive to a change in the palm fluid pressure.

16. The gripper according to any one of claims 13 to 15, wherein the plurality of devices are distributed in a radial symmetry about the central axis.

17. The gripper according to any one of claims 13 to 15, wherein selected ones of the plurality of devices are distributed in a mirror symmetry about an axis of symmetry.

18. The gripper according to any of claims 13 to 17, wherein the gripper is changeable between any two of a plurality of modes of operation, and wherein the plurality of modes of operation comprises: a default mode, a pinch mode, a power mode, a wide mode, and a scoop mode.

19. The gripper according to claim 18, wherein the gripper is configurable to form at least a partial closed volume between the palm and the plurality of devices.

20. A gripper system, comprising:

a control circuit; and

a gripper operably coupled to the control circuit, the gripper including:

a palm defining a central axis; and

a plurality of devices, each of the plurality of devices including:

a finger body, the finger body including one or more finger cavities disposed along a length of the finger body, the length of the finger body in a default shape defining a first axis, the finger body being bendable away from the first axis in response to a change in a finger fluid pressure in the one or more finger cavities; and

a petal, the petal being coupled to the finger body at one or more points along the length of the finger body, the petal having one or more petal cavities disposed thereon,

wherein the petal is deformable in response to the bending of the finger body and/or a change in a petal fluid pressure in the one or more petal cavities, wherein the petal comprises at least one lateral portion, and wherein the petal is deformable by displacing the at least one lateral portion,

wherein each of the plurality of devices is coupled to the palm via a respective coupling independently of any other of the plurality of devices,

and wherein the respective finger body of the plurality of devices collectively define a working aperture,

and wherein the plurality of devices and the palm collectively define a workspace volume,

and wherein the control circuit is configured to control each of the following independently of any other in the group consisting of: the finger fluid pressure, the petal fluid pressure, and the palm fluid pressure.