According to an aspect of the invention, there is provided a user interface for an interactive device, the user interface comprising: an interactive surface formed by an array of displaceable surface members; an oscillatory signal generator configured to generate an oscillatory signal; and characterised by a cable array coupled to the oscillatory signal generator, wherein the surface members are connected to the cable array such that the oscillatory signal is carried from the oscillatory signal generator to the surface members, and wherein the surface members have a resting position with respect to the cable array and movement of the surface members from the resting position causes the cable array to move thereby adjusting the oscillatory signal to produce a modified oscillatory signal and/or a modified oscillatory signal causes the cable array to move thereby forcing the surface members to move from the resting position; the user interface further comprising a signal converter which converts the modified oscillatory signal to and/or from an electrical signal of the interactive device.Herein disclosed is a user interface for an interactive device, the user interface comprising: an interactive surface formed by an array of displaceable surface members, the surface members having a resting position; an oscillatory signal generator configured to generate a oscillatory signal, the oscillatory signal generator being coupled to the surface members by a cable array which is configured to carry the oscillatory signal to the surface members, the surface members having a resting position with respect to the cable array; wherein the cable

CLAIMS

1. A user interface for an interactive device, the user interface comprising:

an interactive surface formed by an array of displaceable surface members;

an oscillatory signal generator configured to generate an oscillatory signal; and

characterized by:

a cable array coupled to the oscillatory signal generator, wherein the surface members are connected to the cable array such that the oscillatory signal is carried from the oscillatory signal generator to the surface members, and

wherein the surface members have a resting position with respect to the cable array and movement of the surface members from the resting position causes the cable array to move thereby adjusting the oscillatory signal to produce a modified oscillatory signal and/or a modified oscillatory signal causes the cable array to move thereby forcing the surface members to move from the resting position;

the user interface further comprising a signal converter which converts the modified oscillatory signal to and/or from an electrical signal of the interactive device.

2. A user interface as claimed in claim 1, wherein the surface members are mounted to a movable support member, the support member coupling the surface members to the cable array.

3. A user interface as claimed in claim 1 or 2, wherein the surface members are mounted to the support member via a pair of intermediate mounting members.

4. A user interface as claimed in claim 3, wherein the intermediate mounting members are disposed on either side of a pivot point of the support member.

5. A user interface as claimed in claim 3 or 4, wherein the support memberforms a base layer, the intermediate mounting members form an intermediate layer and the surface members form a surface layer, wherein each element of an underlying layer supports twice as many elements of an overlying layer as are in the underlying layer.

6. A user interface as claimed in any of claims 3 to 5, wherein the support member, the intermediate mounting members and/or the surface members are

configured so as to have at least two degrees of freedom and are biased towards the resting position.

7. A user interface as claimed in any of claims 3 to 6, wherein the surface members are secured to the support member and/or intermediate mounting members using resilient cable binding, biasing the surface members towards the resting position

8. A user interface as claimed in any of claims 3 to 7, wherein the surface members are detachably mounted to the support member or the intermediate member, and/or the intermediate member is detachably mounted to the support member.

9. A user interface as claimed in any preceding claim, wherein the surface members are formed by posts which project from a proximal end nearest the cable array to a distal end, the distal ends of the surface members being adjacent to one another and defining the interactive surface.

10. A user interface as claimed in claim 9, wherein the posts are formed by an outer sleeve and an inner element which is received within the outer sleeve to form a telescoping arrangement.

11. A user interface as claimed in claim 10, wherein the outer sleeve and inner element are biased towards an extended position.

12. A user interface as claimed in claim 10 or 1, wherein the outer sleeve and inner element are threadingly engaged with one another such that rotation of the outer sleeve relative to the inner element causes the outer sleeve to translate axially relative to the inner element.

13. A user interface as claimed in any of claims 1 to 8, wherein the surface members are formed by chevron-shaped wings which each define a quadrant of an opening, the interactive surface comprising a plurality of openings.

14. A user interface as claimed in claim 13, further comprising a movable ball which is configured to traverse across the interactive surface in response to movement of the user interface, the ball having a plurality of projections which are

received by the openings and which cause the surface members to move from the resting position so as to produce the modified oscillatory signal.

15. A user interface as claimed in claim 14, wherein the interactive surface is formed by a plurality of beltways which are disposed in different planes to enclose the ball, each of the beltways having a plurality of openings.

16. A user interface as claimed in claim 15, wherein the projections are arranged such that, at any one time, only one opening of each beltway receives a projection of the ball.

17. A user interface as claimed in any of claims 14 to 16, wherein the ball is coupled to a movement controller via a plurality of cables, wherein, in response to movement of the user interface, the movement controller moves relative to the user interface and in turn causes the ball to traverse across the interactive surface.

18. A user interface as claimed in any preceding claim, wherein the interactive surface is formed by a plurality of independent but functionally coupled modules, each module comprising a plurality of surface members.

19. A user interface as claimed in claim 18, wherein the interactive surface is configured to be adapted by replacing modules and/or introducing additional or removing modules to change the size of the interactive surface.

20. A user interface as claimed in claim 18 or 19, wherein the modules are coupled to one another by complementary abutting features, interconnections or via an interconnecting cable network.

21. A user interface as claimed in any of claims 18 to 20, wherein each module is supported by a central shaft.

22. A user interface as claimed in claim 21, wherein the central shaft is connected to the module at one end and a jack at an opposite end, the jack being configured to raise and lower the module relative to adjacent modules.

23. A user interface as claimed in claim 22, wherein the jack is formed by first and second plates which are connected by a plurality of jacking members, the

jacking members being spaced around the circumference of the first and second plates; wherein the jack has a raised configuration in which each of the jacking members is arranged axially such that their ends are aligned with one another in an axial direction, and a lowered configuration in which each of the jack members is angled with respect to the axial direction such that their ends are offset from one another in the axial direction; wherein the jack is movable between the raised and lowered configurations by rotating the first and second plates relative to one another.

24. A user interface as claimed in claim 22 or 23, wherein the jack is configured to lower the surface members of the module to below the level of adjacent modules, wherein replacement surface members are held beneath the interactive surface, and wherein a replacing device is provided beneath the interactive surface to replace the surface members of the module with the replacement surface members.

25. A user interface as claimed in claim 24, wherein the surface members and replacement surface members have different physical properties.

26. A user interface as claimed in any of claims 22 to 25, wherein the jack is configured to raise the module above the level of adjacent modules to allow the module to be replaced with another module before being lowered to its original position.

27. A user interface as claimed in any of claims 19 to 26, wherein the modules are arranged in a grid formed by a plurality of columns of modules, with the cable array coupling the modules in each column to one another.

28. A user interface as claimed in claim 27, wherein the cable array further couples adjacent pairs of columns to one another.

29. A user interface as claimed in claim 27 or 28, further comprising an interpreting unit coupled to the cable array at the end of each column, wherein the interpreting unit is configured to receive and interpret the modified oscillatory signal to derive information regarding the movement of the individual modules and/or to generate a modified oscillatory signal which causes the individual modules to move from their resting positions.

30. A user interface as claimed in claim 29, further comprising an integrating unit which is in communication with a plurality of interpreting units, the integrating unit being configured to combine signals from the interpreting units into a single signal and/or decompose a signal into parts for each interpreting unit.

31. A user interface as claimed in claim 30, wherein the signal converter comprises an analogue to digital and/or digital to analogue converter which is configured to convert an analogue signal from the integrating unit into a digital signal to be used by the interactive device and/or to convert a digital signal from the interactive device into an analogue signal to be used by the integrating unit.

32. A user interface as claimed in claim 31, wherein the analogue to digital converter comprises an optical sensor having an emitter and a receiver, and an interrupter disposed between the emitter and the receiver; wherein the interpreter is configured to oscillate across a path between the emitter and receiver in response to an analogue signal such that the receiver observes a digital signal.

33. A device comprising a user interface as claimed in any preceding claim.