function, 12×12 small displays as used in a TV studio , or picture in-picture features found in commercial TVs or editing suites).

[0242] Depending on the type of packing, various schemes can be used to allow for permanent, intermittent, or even one-time communication between display tiles. For example, close packed tiling can make use of wired connectivity between computers or could use a variety of wireless or optical communication technologies. In the case of wired connectivity, edge mounted conventional plug and socket connectors may be used to create a rigid tiled array. Plug and socket systems lend themselves to parallel connections for bulk and high-speed data transfer. They also provide a convenient method of power distribution, which can allow for one of the tiles providing a power source that supports the rest of the array. A plug and socket connection between tiled computers **692** in a tiled computer array **690** (with both data and power transfer shown) is schematically illustrated by lines **695** in **FIG. 48**.

[0243] The exact design and locations of electrical connectors depends on the intended use, and subsequently , the shape of tile components. For applications where large seams between displays are acceptable , simple rigid connectors could be attached to the center of each edge, providing connectivity to all the surrounding tiles. Other applications might require a more complex design. For example, applications which require high-quality information display on a seamless array surface (i.e. tiled blueprints), might employ spring-loaded contacts on the four edge connectors. The spring mechanism allows all array connections to be made below the display surface, while tiles can still be inserted and removed from the interior of the array. Removal of tiles could be triggered by some host signal which actuates a release of the spring and pops the tile out of the array.

[0244] Serial connectivity can also be used in a close packed arrangement such as that illustrated in **FIG. 43**. It has the advantage that fewer connections have to be made and in practice it might be more reliable. However the net bandwidth between tiles will be less than a parallel system. Serial communication lends itself to optical and wireless systems thus removing the need for any physical connections. For optical technologies alignment of the transmitter and receiver is still important although the clever use of light pipes and lens capture techniques can introduce more flexibility. Wireless systems can use many different bands of the EM spectrum (kHz, MHz, GHz), utilizing a variety of modulation techniques (amplitude modulated, frequency modulated, or those based on code division multiple access) and operate at a range of transmitter powers. There is no longer a need for direct alignment if the system is designed with suitable communication tolerances. The transmitter range plays a crucial part in the design. If there is only enough power in an emitted signal to be picked up within a few millimeters of a tile edge, then the signals will be isolated, the topology will be defined by the physical connectivity and the complexity of designing the system to avoid interference from neighboring signal sources will be minimized. However, an alternative design is to use more powerful radios. In this case all tiles will be able to contact all other tiles and inter-tile connectivity needs to be defined by another parameter. Signal strength can be used or, more deliberately, information that relates the ID of a tile to a spatial map (perhaps held in one master tile) describing the position of all tiles in the tile array. In this system it is also necessary to minimize inter-tile interference. For digital packet-data systems that operate at the same frequency, carrier sense multiple access (CSMA-CD or CSMA-CA) systems are well known techniques to solve this problem. Other solutions involve tiles using different frequencies, with frequencies reused depending on the power of the transmitters. This is the technique used by traditional cellular telephones. Yet another approach is to use Code Division Multiple Access (CDMA) that relies on the overlaying of signals in the same region of the EM spectrum, a technique known as spread spectrum modulation.

[0245] For loose packed display tiles, the wireless techniques described above in connection with close packed tiling generally become essential to the implementation. However, a special case of loose packing exists in which each edge of a tile does make contact with every other surrounding tile, except that it may only be a single point of contact and not at a accurately defined place. A wired version of this system can be built in which the entire edge of each tile is a serial connection including one of the two vertices that define the edge. Communication in each direction can be achieved by a variety of commercially available techniques, including use of a one-wire interface (plus a ground) for bidirection communication between tags and a reader. Note that the ground connection for a tile arrangement can be derived by sharing a common ground connection through the surface the tiles are laid out on. For example, the surface could be made of a metal sheet. The system may be further enhanced by ensuring that the edge contact is made of a magnetic material and the vertices have a magnet embedded in the end. Such an arrangement ensures that there will be a good electrical contact between the transmitter and the receiver.

[0246] The receiver can also derive power from an electrically transmitted signal by bridge-rectifying it and storing the collected charge in a capacitor for use by its own electronics. Thus, power distribution can also be included in a one-wire interface. In this way flexible connectivity can be achieved to support the rapid and convenient rearrangement of tiles in which only the minimum amount of care needs to be taken in setting up connectivity.

[0247] Loosely packed tile displays such as illustrated in **FIG. 45** may require that the display surfaces use a best effort algorithm to present a unified display with all the sections of the displayed image bearing the correct spatial arrangement to each other even though, in the case of rectangular tiles, they might not be registered vertically or horizontally and have an offset angle relative to each other. In order to implement the desired tile display algorithm, not only is the relative arrangement of tiles important but the exact offset (distance and angle) from each other is also important. There are several methods that are suitable for automatically determining offsets between loosely packed tiles. For example, as illustrated with respect to **FIG. 46** (showing communicating tiles **652** and **654**, with respective displays **651** and **653**), optical encoding **660** along an edge can be used to identify tile orientation. It is possible to use a binary coded optical pattern along an edge which is regular and encodes the distance from a vertex at any point. A tile that abuts, or is relatively aligned, can read this pattern using optical sensors **658** and **659** and determine the display offset