which defines an object. By providing sensors **58** in cooperation with the inductive coils, the movement of the display element rods can be converted to a scanning signal. The location and motion of the rods along with the amount of force on the rod can be determined by the sensors **58** and converted to an electronic signal for transmittal to a computer processor. Additionally, the brightness, color, temperature, and resiliency of each area of an object contacted by the rods can be measured by an appropriate sensor **59**. An aggregation of each of the sensor's output can be used to define an object if there are sufficient sensors spaced an appropriate distance apart to measure the object with sufficient "resolution." The data can be assembled to form a digital signal defining the object's size, shape, color, temperature, and hardness.

In operation an object such as that shown in FIG. **1** is placed on top of the scanner (or the scanner can be lowered onto the object). Each probe will be displaced a certain amount depending on the height of the object at that particular point. The amount of displacement at each location can be recorded using Cartesian coordinates as discussed above to identify the appropriate height (z) at each point according to the row (x) and column (y) of the scanner (FIG. **2**). The information can be assembled into one or more computer readable documents (digital signals) for later transmittal, display, or storage. Additionally, for each coordinate (x,y) or (x,y,z), an additional piece of data can be attached for later reference and display. The additional data may include the other sensory data discussed above such as the temperature, hardness, brightness, color, or a combination of these.

In a preferred application, the display is used to remote broadcast an object in real time over the internet or other network. As best shown in FIG. **7**, an object to be transferred is scanned in by using the display in its capacity as a scanner. It is envisioned that the scanner and display can be used as a personal communication system between to remote persons. By pressing one user's face against the scanner, the face of the user is broadcast to the remote user in both base relief and image. Tactile feedback can be enhanced by using the display simultaneously as a scanner and a display such that the second user can touch the display showing the face of the first user, for instance, and transmit the "feel" of that touch to the face of the other user. It is here that the sensors transmitting the temperature, hardness, and force of the users "touch" back to the first user hint at the importance and quantity of additional information that can be carried over the present system. The ability to reach out and actually touch a remote user is achievable by the present system in a way that was not practical by two dimensional "visual" monitors. In this way the display not only transmits the image of an object, but transmits "touch." Additionally sound information could be attached to the file or transmitted in parallel to the digital signal for two way communication.

Additionally, if the display is used as both a display and a scanner, then an object displayed on the display can be manipulated by manually moving display elements to provide interactive modeling or dynamic sculpturing of the model. A user at one remotely connected terminal can display his version of the model, and a user viewing the display at a second terminal can manipulate the model to add corrections or suggestions. Iterations of this interactive manipulation of the display can be used to provide input from different parties at remote locations on the same object.

As shown in FIGS. **9**, **10** and **12**, alternative means other than LED and photodiodes can be used to illuminate the LDs **18**, **19** of the display elements **14**. One such method is an external laser **100**. A group of three lasers **100** is shown directed to a stationary collector **102** which focuses and channels the light in a fiber optic display element **114**. The display element **114** is preferably transparent. One skilled in the art would also appreciate that the display element could be solid or a hollow tube. The light is then transmitted to an LD **18**, **19** for display. The stationary display **102** may consist of one channel for connecting to one LD, or may have several conduits for distribution to various LDs within one display element **114**. The laser may be directed to a particular stationary collector by appropriate means including movable mirror, lenses or other means. As shown in FIG. **9**, an individual laser or group of lasers may be provided for each display element **114** or for a small group of display elements **114**.

As shown in FIG. **12**, a moving vacuum tube display element **116** can be used in place of the fiber optic display element **114**. In this case, a transparent glass vacuum tube **118** surrounds a color plasma display having a red, green and blue phosphor elements **120** for displaying colors. Barriers **122** are provide for separating or collecting the different color areas. In addition to divisions of color axially, the upper barriers **124** divide the tube radially into three separate color zones of red, green and blue.

In a second embodiment of the invention, a stationary display capable of displaying in true three dimensions is disclosed. FIG. **13** shows a number of representative optical rods **128** which are fixed relative to each other. The rods are transparent and each contain a number of LEDs **130** or other illuminating elements along the body and top of the rod. The LEDs are preferably wired with transparent conducting wire that is know to those of ordinary skill in the art. In this way the LEDs make up a grid of pixels ("light elements") that are fixed in a transparent medium formed by the optic rods and wiring elements. If necessary additional plastic material can be added between the elements to provide for more consistent transmission of light throughout the entire stationary display. A grouping of the individual optic rods **128** form the three dimensional display. Preferably the rods are arranged in parallel bundles similar to the display elements of the first embodiment of the invention to form a complete display.

In distinction to the moveable three dimensional display described above, the current device uses a fixed three dimensional grid of lighting elements **130** to display in three dimensions. The digital signal **80** providing the definition of the object to be displayed contains information on each point in the contour of the object **60** as described above. Instead of moving the display element **14** as discussed above to move an LD **18**, **19** into proper position to display a point on the contour of the object, the stationary device already has an LED **130** in any position required within the bounds of the device. Similar to the first embodiment, each rod **128** is assigned a particular x,y coordinate based on its location within the display. The display control circuit transmits the z value for the particular control rod and illuminates an LED **130** at the particular location to color and define the surface of the object to be modeled. Because the grid is made of a three dimensional matrix of pixels, a true three dimensional image of the object is displayed. In addition to displaying lighting elements along the surface of the object, a cross section of the object at any particular point could also be displayed as discussed above.

A third embodiment of the invention is shown in FIG. **14**. In this embodiment the display is formed of a number of transparent panels **140** of LED lights **142** capable of displaying red, green and blue pixels in rows and columns