3015. Imaging device **3032** is positioned within the cabinet **3016** by the bracket **3033** so that it does not interfere with the light path of the projected image.

[0112] During operation of the touch table **3010**, processing structure **3020** outputs video data to projector **3022** which, in turn, projects images through the IR filter **3024** onto the first mirror **3026**. The projected images, now with IR light having been substantially filtered out, are reflected by the first mirror **3026** onto the second mirror **3028**. Second mirror **3028** in turn reflects the images to the third mirror **3030**. The third mirror **3030** reflects the projected video images onto the display (bottom) surface of the touch panel **3014**. The video images projected on the bottom surface of the touch panel **3014** are viewable through the touch panel **3014** from above. The system of three mirrors **3026**, **3028**, **3030** configured as shown provides a compact path along which the projected image can be channeled to the display surface. Projector **3022** is oriented horizontally in order to preserve projector bulb life, as commonly-available projectors are typically designed for horizontal placement.

[0113] The projector **3022**, and IR-detecting camera **3032** are each connected to and managed by the processing structure **3020**. A power supply (not shown) supplies electrical power to the electrical components of the touch table **3010**. The power supply may be an external unit or, for example, a universal power supply within the cabinet **3016** for improving portability of the touch table **3010**. The cabinet **3016** fully encloses its contents in order to restrict the levels of ambient visible and infrared light entering the cabinet **3016** thereby to facilitate satisfactory signal to noise performance. Doing this can compete with various techniques for managing heat within the cabinet **3016**. The touch panel **3014**, the projector **3022**, and the processing structure are all sources of heat, and such heat if contained within the cabinet **3016** for extended periods of time can create heat waves that can distort the optical components of the touch table **3010**. As such, the cabinet **3016** houses heat managing provisions (not shown) to introduce cooler ambient air into the cabinet while exhausting hot air from the cabinet. For example, the heat management provisions may be of the type disclosed in U.S. patent application Ser. No. 12/240,953 to Sirotich et al., filed on Sep. 29, 2008, entitled "TOUCH PANEL FOR AN INTERACTIVE INPUT SYSTEM AND INTERACTIVE INPUT SYSTEM INCORPORATING THE TOUCH PANEL" and assigned to SMART Technologies ULC of Calgary, Alberta, the assignee of the subject application, the content of which is incorporated herein by reference.

[0114] As set out above, the touch panel **3014** of touch table **3010** operates based on the principles of frustrated total internal reflection (FTIR), as described further in U.S. patent application Ser. No. 12/240,953 to Sirotich et al., referred to above. FIG. **27** is a sectional view of the table top **3012** and touch panel **3014**. Table top **3012** comprises a frame **3120** formed of plastic supporting the touch panel **3014**.

[0115] Touch panel **3014** comprises an optical waveguide **3144** that, according to this embodiment, is a sheet of acrylic. A resilient diffusion layer **3146**, in this embodiment a layer of V-CARE® V-LITE® barrier fabric manufactured by Vintex Inc. of Mount Forest, Ontario, Canada, or other suitable material lies against the optical waveguide **3144**.

[0116] The diffusion layer **3146**, when pressed into contact with the optical waveguide **3144**, substantially reflects the IR light escaping the optical waveguide **3144** so that escaping IR light travels down into the cabinet **3016**. The diffusion layer **3146** also diffuses visible light being projected onto it in order to display the projected image.

[0117] Overlying the resilient diffusion layer **3146** on the opposite side of the optical waveguide **3144** is a clear, protective layer **3148** having a smooth touch surface. In this embodiment, the protective layer **3148** is a thin sheet of polycarbonate material over which is applied a hardcoat of Marnot® material, manufactured by Tekra Corporation of New Berlin, Wis., U.S.A. While the touch panel **3014** may function without the protective layer **3148**, the protective layer **3148** permits use of the touch panel **14** without undue discoloration, snagging or creasing of the underlying diffusion layer **3146**, and without undue wear on users' fingers. Furthermore, the protective layer **3148** provides abrasion, scratch and chemical resistance to the overall touch panel **3014**, as is useful for panel longevity.

[0118] The protective layer **3148**, diffusion layer **3146**, and optical waveguide **3144** are clamped together at their edges as a unit and mounted within the table top **3012**. Over time, prolonged use may wear one or more of the layers. As desired, the edges of the layers may be unclamped in order to inexpensively provide replacements for the worn layers. It will be understood that the layers may be kept together in other ways, such as by use of one or more of adhesives, friction fit, screws, nails, or other fastening methods.

[0119] An IR light source comprising a bank of infrared light emitting diodes (LEDs) **3142** is positioned along at least one side surface of the optical waveguide layer **3144** (into the page in FIG. **27**). Each LED **3142** emits infrared light into the optical waveguide **3144**. In this embodiment, the side surface along which the IR LEDs **3142** are positioned is flame-polished to facilitate reception of light from the IR LEDs **3142**. An air gap of 1-2 millimetres (mm) is maintained between the IR LEDs **3142** and the side surface of the optical waveguide **3144** in order to reduce heat transmittance from the IR LEDs **3142** to the optical waveguide **3144**, and thereby mitigate heat distortions in the acrylic optical waveguide **3144**. Bonded to the other side surfaces of the optical waveguide **3144** is reflective tape **3143** to reflect light back into the optical waveguide layer **3144** thereby saturating the optical waveguide layer **3144** with infrared illumination.

[0120] In operation, IR light is introduced via the flame-polished side surface of the optical waveguide **3144** in a direction generally parallel to its large upper and lower surfaces. The IR light does not escape through the upper or lower surfaces of the optical waveguide due to total internal reflection (TIR) because its angle of incidence at the upper and lower surfaces is not sufficient to allow for its escape. The IR light reaching other side surfaces is generally reflected entirely back into the optical waveguide **3144** by the reflective tape **3143** at the other side surfaces.

[0121] As shown in FIG. **28**, when a user contacts the display surface of the touch panel **3014** with a pointer **3011**, the touching of the pointer **3011** against the protective layer **3148** compresses the resilient diffusion layer **3146** against the optical waveguide **3144**, causing the index of refraction on the optical waveguide **3144** at the contact point of the pointer **3011**, or "touch point" to change. This change "frustrates" the TIR at the touch point causing IR light to reflect at an angle that allows it to escape from the optical waveguide **3144** in a direction generally perpendicular to the plane of the optical waveguide **3144** at the touch point. The escaping IR light reflects off of the pointer **3011** and scatters locally downward through the optical waveguide **3144** and exist the optical