[0039] Optical units **1***a* and **1***b* having therein an optical system composed of a light emitting element, a light receiving element, a polygon mirror and various lenses are respectively provided on the outside of both corners of one short side (the right side in this embodiment) of this rectangular display screen **10** that is the extent of a plane specified as a target area to be touched by an indicator S such as a finger and pen. Moreover, a recurrence reflection sheet **7** as a retro-reflector is provided on the outside of three sides other than the right side of the display screen **10**, namely, the upper, lower and left sides.

[0040] **FIG. 2** is a perspective view showing the structure of the optical units **1***a*, **1***b* and the optical path. Both of the optical units **1***a* and **1***b* have the same internal structure. The optical unit **1***a* (**1***b*) includes a light emitting element **11** composed of a laser diode (LD) for emitting infrared laser light (wavelength: 780 nm); a collimation lens **12** for changing the laser light from the light emitting element **11** into parallel light; a light receiving element **13** composed of a photodiode (PD) for receiving reflected light from the recurrence reflection sheet **7**; a polygon mirror **14** having the shape of a square column, for example, for angularly scanning the laser light from the light emitting element **11**; an aperture mirror **15** as a deflecting unit for limiting light to be projected onto the polygon mirror **14** from the collimation lens **12** by an aperture **15***a* and for reflecting light reflected from the recurrence reflection sheet **7** through the polygon mirror **14** toward the light receiving element **13**; a condenser lens **16** for focusing the reflected light from the aperture mirror **15** onto the light receiving element **13**; a motor **17** for rotating the polygon mirror **14**; and an optical unit main body **18** on which these members are mounted and fixed.

[0041] The laser light emitted by the light emitting element **11** is made parallel light by the collimation lens **12**, passes through the aperture **15***a* of the aperture mirror **15**, and is then angularly scanned in a plane substantially parallel with the display screen **10** by rotation of the polygon mirror **14** and projected onto the recurrence reflection sheet **7**. After the reflected light from the recurrence reflection sheet **7** is reflected by the polygon mirror **14** and aperture mirror **15**, the reflected light is focused by the condenser lens **16** to enter the light receiving element **13**. However, if the indicator S is present on the optical path of the scanning light, the scanning light is cut off, and therefore the reflected light does not enter the light receiving element **13**.

[0042] The optical units **1***a* and **1***b* are connected with light emitting element drivers **2***a* and **2***b* for driving the respective light emitting elements **11**, light receiving signal detectors **3***a* and **3***b* for converting the quantity of light received by the respective light receiving elements **13** into electric signals, and a polygon controller **4** for controlling the operation of the respective polygon mirrors **14**. Moreover, reference numeral **5** represents an MPU for calculating the position and size of the indicator S and for controlling the operation of the entire apparatus, and **6** represents a display device for displaying the results of calculations performed by the MPU **5**.

[0043] The MPU **5** transmits drive control signals to the light emitting element drivers **2***a* and **2***b*, so that the light emitting element drivers **2***a* and **2***b* are driven according to the drive control signals and the light emitting operations of the respective light emitting elements **11** are controlled. The light receiving signal detectors **3***a* and **3***b* transmit the light receiving signals of the reflected light of the respective light receiving elements **13** to the MPU **5**. The MPU **5** calculates the position and size of the indicator S based on the light receiving signals from the respective light receiving elements **13**, and displays the results of the calculations on the display device **6**. Here, the display device **6** may also serve as the display screen **10**.

[0044] In such an optical scanning-type touch panel of the present invention, if the explanation is given with respect to the optical unit **1***b*, for example, as shown in **FIG. 1**, the projected light from the optical unit **1***b* is scanned in a counterclockwise direction in **FIG. 1** from a position where the projected light is reflected by the aperture mirror **15** and directly enters the light receiving element **13** to a position (Ps) where the projected light is reflected by an end of the recurrence reflection sheet **7**, that is, a scanning start position. Then, the projected light is reflected by the recurrence reflection sheet **7** until it comes to a position (P1) where the projected light reaches one end of the indicator S, but the projected light is cut off by the indicator S up to a position (P2) where it reaches the other end of the indicator S, and then the projected light is reflected by the recurrence reflection sheet **7** until it comes to a scanning end position (Pe).

[0045] In such scanning of light, a detected light signal given when the projected light from the light emitting element **11** directly enters the light receiving element **13** from the polygon mirror **14** through the aperture mirror **15** without reaching the recurrence reflection sheet **7** is used as a reference signal. Moreover, a detected light signal given when the scanning light reaches the end (PS in **FIG. 1**) of the recurrence reflection sheet **7** and is reflected therefrom serves as a scanning start signal, and then a recurrence reflection signal is obtained when the reflected light from the recurrence reflection sheet **7** enters the light receiving element **13**. Besides, the scanning angle is measured upon the detection of this reference signal.

[0046] **FIG. 3** is a plan view schematically showing the relationship between the scanning light and the reflected light from the recurrence reflection sheet **7** on the optical scanning-type touch panel. The light emitted by the light emitting element **11** and made parallel by the collimation lens **12** is scanned by the polygon mirror **14** through the aperture **15***a* of the aperture mirror **15**. This scanning light A is reflected by the recurrence reflection sheet **7**, and the resultant reflected light B is reflected by the polygon mirror **14** again, reflected by the light receiving surface of the aperture mirror **15** and guided to the condenser lens **16**.

[0047] At this time, the reflected light B becomes wider in comparison with the scanning light A. **FIG. 4** is an illustration showing the profiles of the scanning light A and reflected light B cut along the C--C line in the scanning region of **FIG. 3**. In comparison with the scanning light A having a diameter of around **1** mm with the optical axis at its center, the reflected light B has a larger diameter of around 30 mm with the optical axis at its center.

[0048] Therefore, when a noise level is specified, an increase of the light receiving area, that is, the effective light receiving area of the aperture mirror **15**, contributes to an improvement of the SIN ratio. However, it is not preferable to increase the aperture mirror **15** boundlessly, and the aperture mirror **15** should be fabricated in a small size in