

lighting unit UT, the light emitted from the light source 2 is guided to the light guiding plate 3 directly or by being collected by means of the reflector 4, and uniformly transmitted to an entire rear surface of the liquid crystal display panel 1, so that characters and images reflected in a display surface 1a of the liquid crystal display panel 1 are visually recognized.

[0041] A surface roughening process is not limited to the texturing, but a sandpaper process, a sandblasting process, an etching process, a plating process, a plasma process, and the like may be employed.

Second Embodiment

[0042] In the present embodiment, as shown in FIG. 2, lubricating grease GS is applied to the contact holding portions 10s of the housings 10 and to the portions 3b of the light guiding plate 3 corresponding to the contact holding portions 10s of the housings 10. The lubricating grease GS may be applied to either or both of the contact holding portions 10s and the portions 3b corresponding to the same. By merely applying the lubricating grease GS to these portions, occurrence of disagreeable crack can be inhibited. According to the present embodiment, since adhesion of the contact holding portion 10s of the housing 10 to the light guiding plate 3 is inhibited, the separating noise generated therebetween can be inhibited.

Third Embodiment

[0043] In the present embodiment, as shown in FIG. 3, a transparent sheet PS is superposed on an upper surface of the light guiding plate 3, and both right and left end portions PSb and PSa of the transparent sheet PS are interposed between the contact holding portions 10s and the light guiding plate 3. The transparent sheet PS is disposed to inhibit a separating noise generated between the housing 10 and the light guiding plate 3, and may be made of a material which does not adversely affect optical characteristics thereof, for example, polycarbonate resin or the like, synthetic resin such as a transparent acrylic plate, and the like. The transparent sheet PS may be formed by the light correction sheet 9 for uniformizing the light emanating from the light guiding plate 3 and entering the liquid crystal display device L. In this case, occurrence of the separating noise can be inhibited by using the conventional components.

[0044] Herein, as shown in FIG. 4, the both right and left end portions PSb and PSa of the transparent sheet PS may be superposed on the housing 10 on which the contact holding portion 10s is not provided, that is to say, an upper surface of the housing 10 may directly contact an upper surface of the light guiding plate 3. Thus, a thin liquid crystal display device L can be obtained.

Fourth Embodiment

[0045] In the present embodiment, as shown in FIG. 5, sliding members SS having a sliding characteristic are interposed between the contact holding portions 10s of the housings 10 and the light guiding plate 3. The sliding member SS having the sliding characteristic is a small piece disposed in order to inhibit the separating noise generated between the contact holding portions 10s of the housing 10 and the light guiding plate 3. Since the sliding members SS having the sliding characteristic as a small piece are dis-

posed only both right and left end portions of a front surface (above in the drawing) of the light guiding plate 3, a wide variety of members having the sliding characteristic may be used without considering its optical characteristics. For example, this may be made of polycarbonate resin or the like, synthetic resin such as a transparent acrylic plate, polyacetal, fluorine-based material, and the like. And, the light correction sheet 9 for uniformizing the light emanating from the light guiding plate 3 and entering the liquid crystal display device L may be used. According to the present embodiment, since adhesion of the contact holding portion 10s of the housing 10 to the light guiding plate 3 is inhibited, the separating noise therebetween does not occur.

[0046] Herein, as shown in FIG. 6, concave portions 3c for fixing the sliding members SS having the sliding characteristic on the light guiding plate 3 may be provided on the light guiding plate 3. By thus providing the concave portion 3c on the light guiding plate 3, displacement of the sliding member SS having the sliding characteristic is inhibited, thereby improving assembling efficiency thereof, and a thin liquid crystal display device L can be obtained.

[0047] Although a case where two straight light sources 2 are used is described in these embodiments, one straight light source may also be used instead of the two straight light sources 2. And, although a case where the light sources 2 are disposed on both sides of the light guiding plate 3 is described, the present invention may be generally applied to edge light types in which a power supply is disposed on one side of the light guiding plate 3, and a light source is disposed in L-shape.

[0048] The lighting unit and the liquid crystal display device using the same according to the present invention are structured such that at least either of the contact holding portion of the housing and the portion of the light guiding plate corresponding to the contact holding portion of the housing has the surface with increased roughness degree formed by texturing or the like, the lubricating grease is applied to at least either of these portions, and the transparent sheet and the sliding member having the sliding characteristic are interposed therebetween. So, even when the light guiding plate and the housing thermally expand by heat generated from the light source and thermally contract when the light source is turned off, a separating noise generated therebetween is inhibited, and it becomes possible to keep a quiet state during and after use of the light guiding plate.

[0049] Although in the above-described first to fourth embodiments, the liquid crystal display panel and the liquid crystal display device are described as examples of the image display element and the image display device, respectively, other components may also be used.

[0050] Numerous modifications and alternative embodiments of the present invention will be apparent to those skilled in the art in view of the foregoing description. Accordingly, the description is to be construed as illustrative only, and is provided for the purpose of teaching those skilled in the art the best mode of carrying out the invention. The details of the structure and/or function may be varied substantially without departing from the spirit of the invention.