

Provisional Patent Disclosure

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Title: Kinetic Far Field Viewing Devices

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Object of the invention

We describe a novel far field viewing apparatus that produces kinetic effects. Such a device will create a visual effect of a static image augmented by twinkling effects and apparent motion.

Background of the invention

US Patent 5,546,198 described far field viewing devices comprised of spectacle frames containing one or more far field holographic lenses. Far field viewing devices superimpose a far field hologram image on a natural scene that contains sufficiently bright and compact sources of light.

In 2000, Holospex, Inc sold far field viewing devices with multiplex lens technology whereby each eye was presented with a lens having different holograms in spatially distinct regions. The simplest form is called dual lens technology. In the dual lens, each eye views the scene through a lens that contains one holographic image in the lower portion and a different holographic image in the upper portion. When looking at a single light, the user could move the frames up and down or tilt his head to see the two different images sequentially in time. Alternatively, in a scene containing many sources of light at different heights, the viewer could see both images at one given time.

The dual lens technology was extended to three lenses and was successfully used to create simple movies. For example, for a number of years, Holospex has manufactured and sold far field devices with a three-frame movie of an angel flapping it's wings. Other moving images have been produced and sold over the past years.

The anti-counterfitting industry introduced the idea of kinetic image-plane holograms that produce the effect of twinkling and motion as the angle of view changes with respect to the image plane.

What is lacking in this prior art is a far field kinetic effect that catches the viewers attention with subtle movements of the viewers body, head or eyes.

The new invention

In the new invention, we introduce the idea of far field kinetic holograms that produce kinetic far field viewing conditions. In the prior multiplex lens holographic technology, the different regions of each lens were arranged systematically to create the movie effect. In our preferred embodiment, we arranged the different motion frames vertically such that the top portion of the lens displayed the beginning frame of the movie and the bottom displayed the last frame of the movie. One can easily envision instead a horizontal sequence of holograms to create motion as the glasses or head are moved side to side. In both cases, significant movement of the head or viewing device is needed to create the movie effect.

The new invention is comprised of lenses that intersperse small holograms or simpler diffractive regions and larger hologram regions whose relative locations are carefully chosen to create a dynamic kinetic effect that will be manifested with much more subtle movement of the body or head. In some cases, simple saccades (involuntary motions) of the eye can produce these effects.

The choice of the size and locations of these small holograms is critical in producing sufficient dynamic effects. If the small holograms are spaced to widely apart, the effect will only occur for very large motions and will not be pleasing to the viewer. If the small holograms are placed too closely together, the viewer will simply see multiple images superimposed on each other with no kinetic effect.

Preferred embodiment

Our trials have led to a preferred embodiment consisting of small holograms on the order of .04 squared millimeters to .16 square millimeters spaced by 2 mm to 6 mm.

In one embodiment, we have produced strong effects by choosing a large static holographic region and simple diffractive gratings that create a dynamic twinkling effect that catches the viewers attention.

In another embodiment, we choose a large static holographic regions and intersperse smaller regions that produce a very similar image as the static region with subtle differences such as angular rotation or size. The net effect is that the viewer sees the image change kinetically as the viewer's body, head or eye moves in any one of a number of ways. The effect can be very effective in capturing the viewer's attention.

Summary

The new invention consists of a far field viewing device that produces dynamic kinetic effects. The device is constructed by carefully choosing the sizes and locations of small holographic or diffractive subregions within the holographic lens presented to the viewers eye or eyes. The hologram can be inserted in any number of viewing devices such as spectacle frames and monacles. Alternatively, the holograms can be placed within the optics of an electronic capture device such as a camera.

While a preferred embodiment has been described, this disclosure describes a more general invention that is not limited to the preferred embodiment.

Figures and more discussion to come soon