Control of Skin Tone Via Microlens Technology

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Introduction

It is now becoming more generally recognized that skin pigmentation is controlled by two critical factors, the translucency of the stratum corneum and the color of the underlying pigment -containing skin components. The skin pigmentation components appear to be principally three molecules including: melanin, hemoglobin and collagen. As a person ages, the appearance of aging is influenced by inconsistencies in the patterns of these three pigments as they reflect back out through the transparent stratum corneum to the eye of the observer. Historically, cosmetic formulations have tried to influence these colors through a masking effect, typically done with opaque, colored particles that lay down on the surface of the skin and attempt to color mask the skin's natural pigments. However, the typical downside of such coloring attempts is that the skin loses a sense of depth and translucency that are indicative of naturally healthy skin. To the observer, a person wearing decorative foundation has skin that appears somewhat flat and two-dimensional. This talk will focus on a new skin tone control technology that works *with* a person's natural pigments rather than against their natural pigments to control signs of aging.

Materials

Lens-coated microlens particles

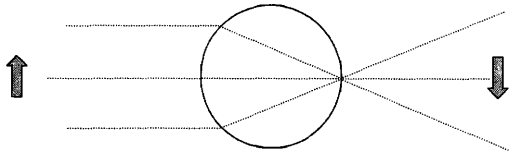
The particles described in this talk are manufactured using a patent-pending technology. The present talk will focus only on a transparent lens-coated microlens.[3] However, colored microlens particles will constitute a segment of this new technology.

Discussion

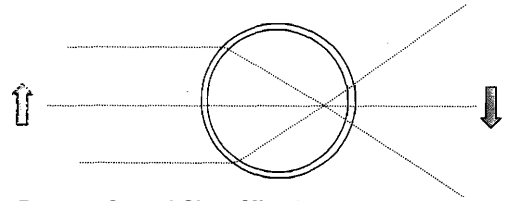
Lens-coated Microlens Technology

The principal of the lens-coated microlens technology is demonstrated in Figure 1 below.

Figure 1. Lens-Coated Microlens Technology



A. Standard Glass Microlens



B. Lens-Coated Glass Microlens

By manipulating the focal length of a micron-sized lens, A, through application of a secondary lens, B, it is possible to control optical features that are projected from the skin back to the eye of an observer. It may be possible to bring features into greater focus or to cause optical blurring effects. In addition, through manipulation of the color of the microlens coating, additional optical effects related to color parameters can be influenced. This paper will discuss our work to develop these types of coated lenses and to demonstrate that indeed, tiny lens-shaped particles can project images which can be captured by the eye of an observer, Figure 2.

Figure 2. Demonstration of the micro-lensing effect. The image shows the tungsten filament from the microscope light source imaged through the microlens.