HOUSING CONSTRUCTION

CROSS-REFERENCE TO RELATED APPLICATION(S)

This application is a continuation of U.S. patent application Ser. No. 16/412,240, filed 14 May 2019, and entitled "HOUSING CONSTRUCTION," which claims priority to U.S. Provisional Patent Application No. 62/736,299, filed 25 Sep. 2018, and entitled "HOUSING CONSTRUCTION," the entire disclosures of which are hereby incorporated by reference.

FIELD

The described embodiments relate generally to three-dimensional structures. More particularly, the present embodiments relate to three-dimensional structures forming components for electronics devices.

BACKGROUND

The components of an electronic device, for example a housing of an electronic device, may include three-dimensional structures having features tailored to the specific purposes for which they are employed. The components of an electronic device may be configured to provide physical support or protection to other components of the electronic device, provide for thermal transmission, provide for airflow through or around the electronic device, or provide for one or more various other purposes. Additionally, the components of the electronic device may be designed to provide a unique and pleasing look and feel for a user.

Recent advances in electronic devices have enabled high levels of performance. Existing components and structures for electronic devices, however, may limit the levels of performance of such devices. For example, an existing housing may limit the performance of an electronic device because of an inability to effectively distribute or reject heat generated by the electronic device to the surrounding environment. In this regard, further tailoring of components for electronic devices to provide additional or enhanced functionality and pleasing aesthetic features may be desirable.

SUMMARY

One aspect of the present disclosure relates to an electronic device including a body having a first surface and a second surface opposite the first surface, a first pattern of first cavities extending into the body from the first surface, a second pattern of second cavities extending into the body from the second surface, one or more second cavities of the second pattern of cavities intersecting with one or more first cavities of the first pattern of cavities to form a pattern of apertures in the body.

In some embodiments, the pattern of apertures can extend substantially across an entire width of the body and include at least two regions separated by a portion of the body that does not include the pattern of apertures. One or more of the first or second pattern of first or second cavities can be a repeating pattern of cavities. The first cavities of the first pattern of cavities can be substantially a same size as the second cavities of the second pattern of cavities. The first and second cavities of the first and second patterns can be substantially spherical or hemispherical. The first and second cavities of the first and second patterns can be substantially positioned in a close-packed arrangement. The first and second cavities of the first and second patterns can be substantially positioned in a hexagonally close-packed arrangement. The body can conduct heat away from a component of the electronic device positioned substantially adjacent to the first surface of the body. The body can have a thickness of less than about 15 mm. The body can include a metal.

Another aspect of the present disclosure relates to a housing for an electronic device including a body having a first surface and a second surface, a first cavity extending into the body from the first surface, and a second cavity extending into the body from the second surface and eccentrically intersecting with the first cavity to form a pattern in the body.

In some embodiments, the first cavity can be substantially a same shape as the second cavity. The first cavity and the second cavity can be substantially spherical or hemispherical. The pattern in the body can include a through-hole. The body can form at least a portion of a housing for an electronic device. The body can include a metal, a ceramic, a polymer, a composite material, or combinations thereof. The housing can define an internal volume configured to surround one or more components of the electronic device.

According to another aspect of the present disclosure, an electronic device can include a body having a first surface and a second surface opposite the first surface, the body including a first repeating pattern of substantially spherical or hemispherical first cavities extending into the body from the first surface, a second repeating pattern of substantially second spherical or hemispherical cavities extending into the body from the second surface, wherein at least one second cavity of the second repeating pattern of cavities eccentrically interferes with at least one first cavity of the first repeating pattern of first cavities to form a matrix of continuous passageways in the body. The matrix of continuous passageways can extend substantially across an entire width of the body and have at least two regions separated by a portion of the body that does not include the matrix of continuous passageways. Furthermore, the electronic device can have a flange surrounding and extending away from the first surface, the flange can include a mounting surface and a display mounted on the mounting surface of the flange.

In some embodiments, the electronic device can further include one or more thermal spreaders disposed adjacent to the first surface of the body. The electronic device can further include a fan disposed adjacent to the portion of the body that does not include the matrix of continuous passageways.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosure will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements, and in which:

FIG. **1** shows a perspective view of an electronic device.

FIG. **2** shows an exploded view of the electronic device of FIG. **1**.

FIG. **3** shows a perspective view of an electronic device.

FIG. **4** shows an exploded view of the electronic device of FIG. **3**.

FIG. **5** shows a perspective view of an electronic device.

FIG. **6** shows an exploded view of the electronic device of FIG. **5**.

FIG. **7** shows a perspective view of an electronic device.

FIG. **8** shows an exploded view of the electronic device of FIG. **7**.