

A study on application of the golden and Fibonacci geometry in design of fashion accessories

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Abstract. The paper presents a study of application of the golden and Fibonacci geometry in design of fashion accessories: bags, scarfs, small accessories, etc. The connection between the application of the golden and Fibonacci geometry in accessories design and sustainable fashion is one of main accents in the study. The application of golden and Fibonacci tilings, floral and animal ornaments, which are created on their base, and geometric forms in golden or Fibonacci proportions are shown. As expressors of beauty, aesthetics, and harmony, the creations on the base of the golden and Fibonacci geometry can be applied in design of fashion accessories directly, as frames, and as parts of new forms. Regardless of the way of the application, the new designs are in strong connections with the sustainable fashion: slow fashion, sustainable trends, zero waste cutting, minimal waste cutting, ecological printing, etc.

1. Introduction

It is considered that the Golden ratio [1] and Fibonacci sequence [2] are the mathematical expression of beauty and harmony. By this reason from the ancient times the golden ratio is used in art and architecture for creation of beautiful proportions. In the present both the golden section and Fibonacci numbers, and their geometrical application are used in arts, design, and architecture.

An investigation of application of the golden ratio, geometrical creations on the base of the golden section (the golden triangle, the golden rectangle, and the golden ellipse) and Fibonacci sequence in fashion design and pattern making is presented in [3]. The research from [3] gives ideas for the presented study about fashion accessories.

This paper presents a study of application of the golden and Fibonacci geometry in design of fashion accessories: bags, scarfs, small accessories, etc. The connection between the application of the golden and Fibonacci geometry in accessories design and sustainable fashion is one of main accents in the study.



2. Golden and Fibonacci series tilings

In the design of fashion accessories tilings with squares and triangles on the base of the golden ratio and Fibonacci sequence can be used: the golden tiling with squares in a spiral direction [4], Fibonacci series square tiling in a spiral direction [5], the golden square tiling in two perpendicular directions [4], Fibonacci series square tiling in two perpendicular directions [5], a tiling on the base of the golden triangle [3], Fibonacci series tiling with regular triangles in two spiral directions [6, 7], etc. Figure 1 presents an application of Fibonacci series tiling with regular triangles in two spiral directions, known as Fibonacci rose [6, 7], in design of a lady's bag, made with a technique, similar to the patchwork.



Figure 1. Application of Fibonacci rose in design of a lady's bag.

3. Floral and animal ornaments and forms

The golden and Fibonacci tilings are used as frames of creation of different geometric forms, which can be used for design of ornaments: floral, animal, or other different from geometric ones.

The golden [8] and Fibonacci [9] spirals are the most popular geometric forms. The golden and Fibonacci spirals are created in the frames of the golden and Fibonacci square tilings in spiral directions.

The golden and Fibonacci spirals can be applied in design of butterflies, formed on the base of two golden or Fibonacci spirals which are connected each another on the base of a bilateral symmetry. The creation of Fibonacci butterfly on the base of two Fibonacci spirals is presented in Figure 2. The golden butterfly is designed similarly on the base of two golden spirals.

Figure 3 presents the ornament of golden butterfly and its application as print in personalized designs of a bag, a watch, a laptop case, and a face mask. For personalization web based services are used: <https://studio.shopvida.com>, <https://artofwhere.com>, <https://www.zazzle.com>, etc.

Figure 4 shows embroidery of Fibonacci butterfly which can be used in designs of scarfs, bags, etc.

Figure 5 presents a necklace with Fibonacci butterflies on the base of Fibonacci spirals made from recycled textile and plastics materials. The same Fibonacci butterflies from recycled textile and plastic materials can be used as bags decoration.