

DESIGN AND MANUFACTURE OF CHESS MODEL

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ABSTRACT

Chess has a long history in China, belonging to a pair of two opposing games. Because of its strong and easy to carry, it is very popular in daily life. In order to improve the ornamental value and the collection value of the chess, the wood consumption is reduced. After researching and contrasting, this paper puts forward the method of making chess by using plexiglass as raw material, and provides reference for the development and production of chess.

Keywords - Chess model, CAD, Plexiglass

1. INTRODUCTION

Chess is also called Chinese chess. Chess can not only exercise people's thinking, cultivate people's sentiment, which itself has a very high collection value, such as high-grade wood, jade and other materials for the chess. More writers and writers wrote poems for the chess, so that the chess has added the cultural color.

At present, Chinese chess with good ornamental value and collection value is usually made of high-grade wood material or high-grade jade, which makes the chess lovers and collectors forget. It affects the good development of chess to a certain extent. Nowadays, the popular chess on the market is made of wood. With the number of chess lovers increasing, the number of chess production increased significantly. It means to cut more trees and cause damage to the ecological environment. Therefore, the development of a very good viewing and practical value and environmental protection of Chinese chess pieces will be the trend^[1].

2. DESIGN

2.1 Research

In wooden chess, wooden fine green sandalwood and gold crab wood chess is the most

expensive. Their market prices are mostly in more than 80,000 yuan, followed by rosewood chess. As for other wooden chess, such as red sandalwood, mahogany, etc., their market price of more than 5,000 yuan to 60,000 yuan between. In addition, the price of non-complete chess will be significantly reduced, and some may be reduced as much as 5 percent. Nowadays, as jewelry prices rise sharply, many people think that the price of chess made with jewels will also rise. But the truth is the opposite. Wood chess contains more national culture. So it is often more valuable than the jewels. Although white jade chess is precious, the market stock very little. Its price has been high. So collectors are hard to afford. From the current chess collection market point of view, the Ming and Qing dynasties chess is the most concerned about the varieties of collectors. Whether the craft is superb is also one of the criteria to measure the value of chess. It is worth noting that the high-end chess are generally exquisite workmanship. His surface is smooth and symmetrical, there will not be too much sculpture. But there are carved treasures chess, collectors will fight to buy.

2.2 Software drawing design

Through the measurement of the height and diameter of the actual chess, we determined that the chess pieces had a diameter of 6 cm and a height of 1 cm. The font was framed and tumbled to 3 mm, and the chessboard was chamfered. The example design process is shown in Figure 1 and Figure 2.

The specific size of the board is: the length of the board = $5 + 5 = 45$; the width of the board = $5 + 5 + 4 = 49$. CAD drawing shown in Figure 4.

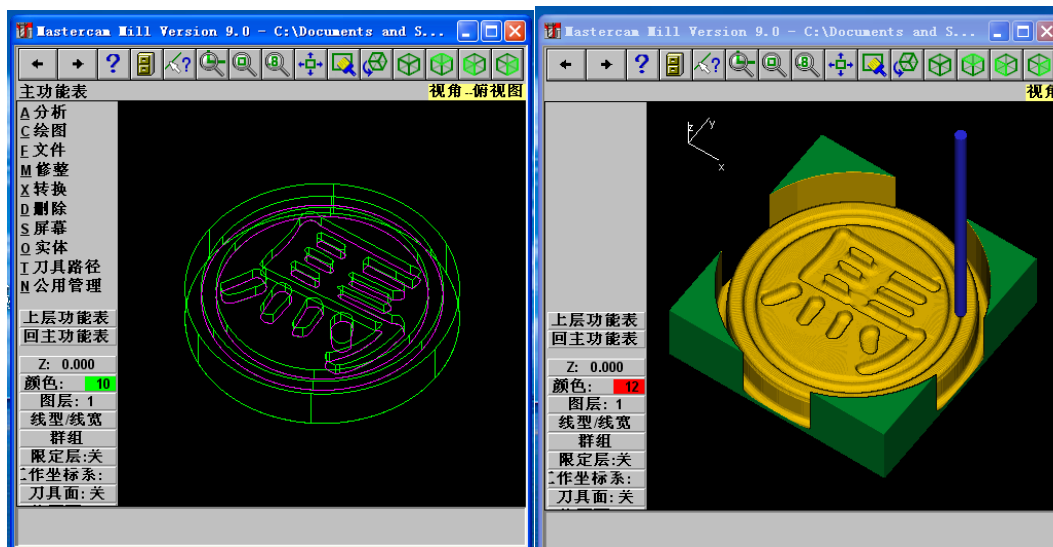


Fig.1 Pieces of three-dimensional map

Fig.2 Tool path simulation



Fig.3 Pieces in kind

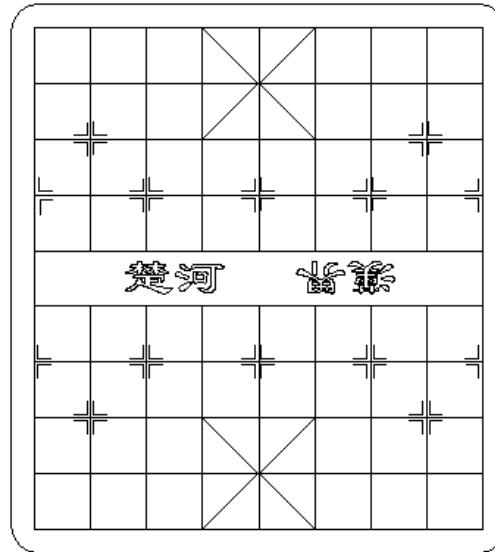


Fig.4 Chessboard CAD drawing

3. MAKING

3.1 Material selection

In the two materials available - aluminum and plexiglass, we have chosen plexiglass as a sustainable material by comparing the difficulty and aesthetics of processing^[2-3].

3.2 Processing and making

In order to ensure the safety of the process, to save material and to test the existence of our problems, in the production of the early phase, the first choice in the wood on the trial processing. We through the trial process to find possible problems and program optimization. After making the material, in order to make the chess more beautiful and practical, we have carefully polished the chess. After all the production is completed, in order to distinguish between the two sides, one of the chess color^[4].



Fig.5 Chess model in kind

4. RESULTS ANALYSIS

4.1 Advantages

Plexiglass painted chess with pearl gemstones with crystal clear and luxurious temperament. It feels good and affordable. Compared with ordinary wood materials, it is environmentally friendly. Black board as a background, can make pieces more prominent. This enhances the visual beauty.

The upper and lower surfaces of the pieces are of different processing options. They are made of surface-emitting technology. It also uses the shape of milling and round and other technologies. This breaks the normality of traditional chess. Chess with an asymmetrical beauty makes it more feel and high technical content.

4.2 Disadvantages

The chess's wide and high proportion design is unsatisfactory. The aesthetics of the word is poor. There are some small flaws in some places. This will affect its commercial value.

5. CONCLUSION

Through the production of chess model, summed up the following points:

- 1) CNC milling in the actual production of a very wide range of applications in the international level is also very developed. Application of CNC milling machine can not only processing the plane, the outer surface, the inner surface, but also processing a variety of surfaces, etc.. It is possible to process the shape within the permissible range of the condition.
- 2) The team is the best way to learn from each other. The team not only allows a task to be done relatively, but the team members can learn a lot. So we can succeed with the shortest possible time and the best possible benefits.

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