

Research on Scientific and Technological innovation of Paper-scrolling Art

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Keywords: Paper-scrolling art, Technology and Art combined, Paper-rolling machine with senso

Abstract. Paper-scrolling is a kind of handmade art spread from the west, after a long period of change, as a decorative item gradually spread. The purpose of this paper is to develop a machine to solve the traditional paper art handmade aspects of the two problems, the first is the speed problem, the second is the machine production instead of manual roll paper problem. Combining the ideas of electrical and electronic expertise and innovative ideas in college students' professional courses, this paper can stimulate students' practical ability and creative thinking, and has certain challenges.

Origin and Development Process of Paper-scrolling

Paper-scrolling, also known as Paper-rolling, is a paper art. Paper-scrolling is simple and practical, the use of rolls, pinch, collage combination can be completed, often used in cards, packaging, decorative painting. It originated in a 15-16-century European monastery and was created by the nuns of the time to decorate religious things. It then entered North America with colonization. Now this particular craftsmanship is once again in vogue. Gradually modernized in the process of application, conveying a concept beyond the tradition, is a challenging creative process.

Traditional Paper-scrolling Practices. Perfunctory note, is a special creation material, it is different from the traditional paper, it has a rich color, and has a width, so, the creation of the paper-scrolling has a semi-stereoscopic linear decoration at the same time can present a three-dimensional sense, we can use the development of this special attribute of the article to create in the creation. The art of paper-scrolling rolls up these slender notes in circles, becomes a small part, and then creates them by combining the complex parts of these styles with different shapes.

The Basic Technology of Paper-scrolling. The Paper-scrolling technology has always been regarded as the edge art in paper art, because it is to convert sculpture and painting skills carrying body into paper, but in the artistic expression does not lag behind other art forms. Traditionally, we would refer to paper as roll paper, because the base material made was a curly tape. The basic shapes of paper bags are tight rolls, free rolls, diamond rolls, teardrop rolls, square rolls, heart-shaped rolls, swirling heart-shaped rolls with openings, semicircular rolls, crescent rolls, triangular rolls, leaf-shaped rolls, peacock eye rolls, rectangular rolls, s-shaped rolls, and so on. The following is a detailed introduction of the basic shape of roll paper:

Figure 1 Tight Rolls-used as a central structure for paper products or to fix other "parts".

Figure 2 Free coil-used to pinch a variety of different shapes.

Figure 3 Diamond Rolls-Start with a free roll and then tighten the compression evenly at the end of both ends.

Figure 4 Tears roll-starts with a free roll and then compresses at one end.

Figure 5 Square coil-Starting in diamond type, Four corners are evenly squeezed.



Figure 1 tight rolls



Figure 2 free rolls



Figure3 diamond rolls



Figure 4 teardrop rolls

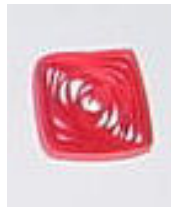


Figure 5 square rolls



Figure6 heart-shaped rolls



Figure 7 swirling heart-shaped rolls

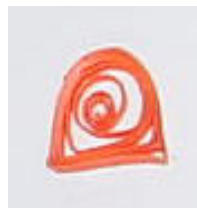


Figure 8 semicircular rolls



Figure9 crescent rolls



Figure 10 triangular rolls



Figure 11 leaf-shaped rolls



Figure12 peacock eye rolls



Figure 13 rectangular rolls

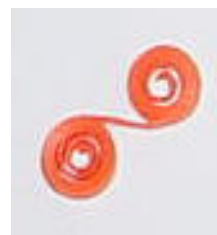


Figure 14 s-shaped rolls

Figure 6 Square coil-Starting in diamond type, Four corners are evenly squeezed.

Figure 7 A vortex-shaped heart shape with openings-this first needs to intercept a small piece of

folded paper, then curl separately from both ends, and if you want to make the curl stronger, you need glue.

Figure 8 Semicircle-First make a loose circle, then pinch at two corners to get an obvious two corners

Figure 9 Crescent Shape-First make a sent circle, then pinch it into a diamond shape and bend in one Direction.

Figure 10 Angular Rolls-can be made to send some can also be made tight, when the roll is round, pinch out three corners on it.

Figure 11 Leaf-shaped coil-first make a round, then pinch two corners at both ends, then twist at the same time to get a slight rotation.

Figure 12 Peacock eye shape-tighten the roll, make a teardrop, need to be as tight as possible.

Figure 13 Rectangular coil-The method is made with a square, which is a slight move of the folding angle.

Figure 14 The S shape volume - - carries on the curl from nearby two direction two, regardless of is the loose and tight all may.

There is also a need for a set of production tools, including paper pens, white latex, rulers, tweezers, wallpaper knives, scissors, sharp iron pen and so on. Take the most basic spiral volume as an example, first put the note on the roll pen, hold down the beginning of the roll paper, and then put the rolled paper roll into the template, it is in line with the size of the required mold, and the latex will be glued to the end of the paper roll. Then use tweezers carefully adjust the interval position of each layer of paper, pinch the required shape by hand, after completion in the bottom of the paper roll with white latex fixed on the paper jam can be.

Combination of Science and Technology and Art ((i)--Electric Paper-rolling Machine

At present, there are all kinds of shapes and sizes of paper-rolling machine - metal, plastic or even just a needle which is opened at the eye of a needle. But this kind of paper winding machine needs to use the hand to press the top of the paper roll, and must be very careful, otherwise it will make the rolled paper dirty and broken. At present, we have invented a kind of electric paper-rolling machine, which fully solves many problems encountered in the process of manual paper rolling. It does not need to press and hold the paper core, and the shape of paper rolling is very neat and beautiful, which can solve the difficulties of paper rolling and at the same time has a high efficiency.

The Key Technology and Innovation of Electric Paper-rolling Machine. The core component of the electric reel is the DC motor, as shown in Figure 15, we through the voltage regulation to achieve the speed of the DC motor adjustment, it can achieve high-speed gear and low-speed file conversion, and has a good maneuverability and innovation.

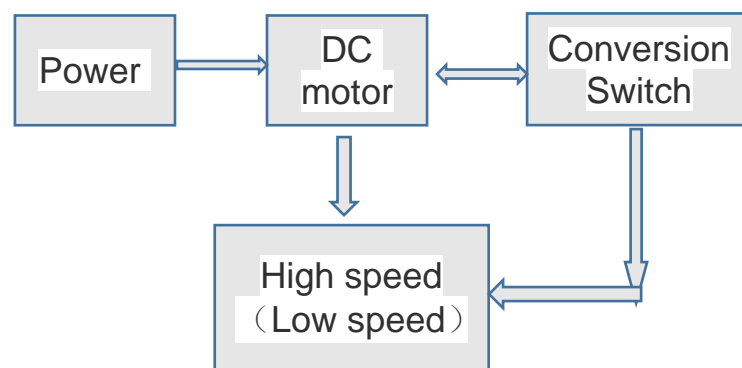


Figure 15 How the motor works

The Difference between and Electric Paper-rolling Machine and Traditional Manual. First of all, manual roll pen speed is slow, electric reel is the most important to solve the problem of slow

speed of manual roll paper, which is why there are not so many manufacturers to invest in the production of paper works, and electric paper feeder can make the production of perfunctory paper more efficient. Next, the manual volume written records modelling is not neat, the rolled paper is non-uniform, not only the electrically operated paper winder the speed is quick, moreover the volume leaves the flower is standard, even, may be spreads out the paper the work effect to be better. This is also to standardize the production process of paper. Third, the use of manual roll paper Pen roll paper for a long time to repeat an action, will lead to hand pain, bubbles, stiff hands and so on, so there is no large amount of paper making, and a lot of paper works less. The electric paper feeder eliminates a series of troubles in artificial production. It is more convenient to put the paper craft works into production, so that the art is really understood by people.

Combination of Science and Technology and Art (ii)--Combination of Sensor and Paper-based Process.

Paper-rolling machine through the tension sensor detection of the paper model, by the CPU control motor rotation direction, loose paper, paper feed volume changes and the change of warp tension, according to the paper model movement to ensure that the color to maintain a constant tension. Make sure to roll out the specified shape of the paper bag. Because the motor with sensor uses microcomputer technology and other electronic technology to control the movement of the whole machine, especially the automatic monitoring of product quality, so that the production efficiency of this kind of paper rolling machine is greatly improved. At the same time, the paper rolling machine on the electronic control system requirements are more and more high, not only to high performance, good stability, easy maintenance, low failure rate, and to be able to adapt to high temperature and humidity, multi-paper scraps environment, power supply fluctuations, group machine interference and other situations also have a strong anti-jamming requirements.

Summary

This article is about the combination of science and technology and art with sensors of the electric Paper-scrolling machine, is intended to better make paper making, improve the technology of roll paper, so that the art of paper-rolling is richer, but did not solve the direct production of finished products according to the needs of consumers. If one day you can create a machine like 3D printer will be the art of paper according to the needs of designers directly to make works of art also need to study the efforts of future generations.

References

- [1] LiBai. Application and promotion of huamo technology.[J]. Academy, 2018(05) .(In Chinese)
- [2] Small motor market development trend.[J]. China science and technology information, 2004(05). (In Chinese)
- [3] NingJi. Science and art blend into each other [J]. media. 2012(01). (In Chinese)
- [4] HongzhuanCai. The application of science and technology in the field of yan paper art. [J]. Wireless interconnection technology, 2014(08). (In Chinese)
- [5] XueyingBai. Study on the art of craft aesthetics of paper[J]. Tomorrow's Fashion, 2018(23). (In Chinese)
- [6] HuxiangDu. Yan paper art development and three-dimensional yan paper technology prospects[J]. The Mass of Literature and Art, 2018(14). (In Chinese)
- [7] XiangWang. Wonderful paper[J]. I Love Learning (creative arts and crafts), 2018(10). (In Chinese)

- [8] XueyingBai. The charm of paper art - on the art of paper craft[J]. The Mass of Literature and Art, 2015(19). (In Chinese)
- [9] BingLiu. Charm Derived paper art [J]. North China Power, 2017(04). (In Chinese)
- [10]HaoZhang. Study on the application design of yan paper art[J]. Modern Decoration (Theory) , 2015(10). (In Chinese)