

Design and Analysis of Portable Dumbbell Type Fitness Puller

Lizhen Liu^{1, a}

¹Wenzhou Vocational & Technical College, Wenzhou. 325035, China.

^aEmail: 1918427983@qq.com

Abstract

China has become one of the economic powers with the most development potential in the world, and the people's life has reached the well-off level on the whole. Since the beginning of the 21st century, China's economy has maintained a steady and rapid growth. At the same time in science and technology, education, medical and other fields are developing at a high speed. With the rapid development of China's economy, the competition among people is becoming more and more fierce, especially the competition for jobs. Under great pressure, people's physical health is put to a great test. Therefore, it is urgent to take exercise and keep fit. And the existing fitness equipment, whether outdoor or home, but also mostly dull and monotonous, lack of human nature, not really considered for the user. Therefore, it is very necessary to design a fitness pull device that can help improve people's physical fitness and reduce their work pressure. In this paper, starting from the current national health status and how to make people get substantial exercise to enhance physical fitness, to cope with various pressures in life and work, increase the enthusiasm for exercise and enhance the emotional aspect of fitness, the design of modern fitness equipment was explored.

Keywords

Fitness; Human nature; Emotion; tubing.

1. The Background

Combined with the current situation of fitness equipment and fitness tools play single, lack of innovation and so on to design a multifunctional handheld fitness equipment. From the appearance design to the fitness method compared with the previous fitness equipment design has a little innovation, can give a person a deep impression. A variety of fitness methods greatly enhance the fun of exercise, so that exercisers get better fitness results. Through the development of its own characteristics of portable handheld fitness equipment, fully mobilize people's demand for fitness exercise, health expectations. The main purpose of this design is to design and develop this portable handheld fitness equipment, stimulate people's enthusiasm for sports fitness, on the other hand, also greatly promote the national fitness this activity, carry forward the positive Olympic spirit.

The determination of the fitness equipment through a large number of relevant data analysis and design. The design process has gone through a variety of design ideas and analysis, sketch drawing, text collation, fitness methods and renderings of the production. The design strives to be scientific and appealing, hoping to promote the development of fitness equipment. Further strengthen the improvement of the national physical quality, promote the implementation of the national fitness campaign. Inspire people's enthusiasm for physical fitness, carry forward the positive Olympic spirit.

2. Conduct Market Research and Find Out Problems

2.1. Existing Fitness Equipment

Fitness equipment often to the number of training functions to be divided into single function and comprehensive multi-functional two categories.

Dumbbell grip: increases arm strength.

Rowing machine: it is mainly used to enhance arm strength, latissimus dorsi and movement coordination.

AMT fitness machine: different from other fitness methods, users can freely switch between different exercise modes and complete zero impact experience, similar to climbing stairs, walking, jogging and long-distance running. You can adjust your training mode to achieve the target of specific muscle groups through this instant conversion mode function.

Elliptical motor: the patented technology of smooth trajectory and cross slope allows users to exercise muscle groups in a biomechanical posture, increasing the diversity and effectiveness of exercise. Zero resistance exercises reduce muscle strain.

Bodybuilding car: when taking exercise, resemble riding a bicycle, basically use to enhance leg ministry strength, enhance cardiovascular function.

Walking bike: mainly used to exercise the legs, waist, abdominal muscles and cardiopulmonary functions.

Treadmill: mainly used to exercise the legs, buttocks, waist, abdominal muscles and cardiopulmonary functions.

Beautiful waist machine: can make to the waist, back loosen massage.

Comprehensive multifunctional device: generally includes chest expander, pull-up, supine push, sit-up and other functions of the equipment. Chest expander, pull-up and supine press are mainly used to exercise upper limb strength and pectoralis major strength. Sit-ups, mainly used to exercise the lumbar muscle group, reduce the waist and abdomen excess fat.

2.2. Existing Problems

Consumers are generally satisfied with the quality of sports and fitness equipment, but the proportion of "poor" and "no evaluation" is still high. It shows that there are still some quality problems. According to the investigation, there are many problems in the quality, such as: the weight of the strength training equipment is not standard, the quality of the parts is bad and there is no place to replace, the surface of the equipment is rough, the spray paint is not uniform, the electroplating is not bright, the noise is too big and so on. The key to many quality problems is that there is no unified quality testing standard. Many small enterprises have backward and simple production equipment and environment, or even no testing equipment, which makes it difficult to verify product quality. According to statistics, China's current national standards and industry standards for sporting goods only

There are 46 kinds of standards and less than 150 kinds of enterprise standards (incomplete statistics). The serious lag of standardization has seriously affected the healthy development and further improvement of the quality of sports equipment.

The reason why the price of sports and fitness equipment is high is not only the high cost price, but also the non-standard commodity price. Many of the materials and techniques used to make them do not reflect the price tag. The same equipment in different stores the price difference is also large. The imperfection of the price mechanism of equipment is an important cause of price chaos. The price mechanism is through the price signal, produces to the producer and the consumer behavior.

The mechanism and results of the influence. It is the interaction of supply and demand of commodity and price. Price mechanism has always been a tool used by merchants to compete. In order to capture the market, must be cheap to win. From the perspective of the whole market, sports fitness equipment prices are generally high, with the rise of fitness fever, the potential of the huge market is bound to make the price of equipment to the popular flow. Perfect price mechanism is the key to promote the healthy development of sports fitness equipment. Therefore, the relevant government departments should standardize the price standard macroscopically, form a good price order, and make the sports fitness equipment market enter a virtuous circle as soon as possible. China's sports fitness equipment development less than 20 years, due to late market development, in

It's not very mature in sales. For example: in the survey, the sales staff on the function of the equipment, use and related instructions, can not meet the customer's inquiries, or originally know little about the equipment professional knowledge. Short due to the time of sports fitness equipment to enter the market, consumers need to accept the process, in this process, should fully display the function of the product, propaganda equipment related knowledge, but in the actual survey, many products, such as: all kinds of multi-functional trainers practice, almost all of the sales staff can speak understand, and can see there are so few consumers, just think, if don't even know that using the method how can spend thousands of yuan to buy? At present, with the publicity of the national fitness program, the awareness of the general public gradually enhanced, in the equipment market to ask a lot of customers, that people have a sense of participation. Therefore, should take the sports fitness equipment market as the national fitness propaganda front. Through the publicity of sports fitness equipment, to enhance people's awareness of the necessity of physical exercise, the rational understanding is always based on perceptual knowledge. Therefore, to improve the sales and service quality of sports fitness equipment, gradually establish a good image of sports fitness equipment, and then become a partner of sports fitness equipment, is a long-term issue in the sales of sports fitness equipment need to constantly innovate.

3. Audience Analysis

3.1. Crowd Positioning

National fitness means that all people need to exercise, in order to get a healthy body, better into the work and life, as the saying goes that the body is the capital of the revolution, with a healthy body, what will be twice the result with half the effort.

Teenager, bone is not fully ossification, in long bone epiphysis cartilage and epiphyseal cartilage exists between the bone and the backbone of childhood and adolescence, epiphyseal cartilage grows fast, especially in the limb is more apparent, and this time, bone of pressure is small, easy to deformation, therefore, physical training content should be given priority to speed and force of the outbreak, less weight, each group of athletic time is short, intermittent time, exercise intensity and exercise moderation. When he yuxiang et al. observed the effect of exercise on adolescent bone density, they divided 46 ordinary primary school students aged 8-9 years into 3 groups. The first group included 13 students, who insisted on 1 hour of track and field training every day. The BMD of 12-4, left femoral neck, large trochanter, Ward's triangle and radioulna of non-dominant arm in the exercise group before and 4 months after the training. The measurement results showed that the BMD of the high-exercise group was better than that of the low-exercise group and the non-exercise group after 4 months of track and field training, and there was no difference between the low-exercise group and the control group. Therefore, teenagers can increase bone density, increase peak bone mass and prevent osteoporosis through physical exercise, and they must achieve certain exercise intensity and sufficient exercise time to achieve good results.

3.2. Young People's Choice of Sports Methods

Young people to 25 basic stop ossification process, greatly enhance their bone stress ability, general athletic ability is also very strong, this period training should use more force and a certain amount of the outbreak absolute strength and endurance exercise, in a more direct exercise to stimulate bone, to produce more apparent curative effect, such as dozens of times and 50-100 meters sprint, push-ups and weight-bearing squat exercise can prevent of limbs long bone nearly, distal and spinal osteoporosis.

3.3. Selection of Exercise Methods for Middle-Aged and Elderly People

The physiological characteristics and exercise ability of the middle-aged and the elderly determine the choice of exercise methods to be different from patients of other age groups. A comparison was made between the general exercise group and the aerobic exercise (long distance running) group. The results showed that with the increase of age, senile osteoporosis was an inevitable trend and an irreversible process, but the decline rate of the aerobic exercise group was lower than that of the general group, indicating that aerobic exercise had a more positive effect on maintaining bone mineral content in vivo and delaying the occurrence of senile osteoporosis. The results confirm that gravity has a good effect on bone formation, as long distance running training increases the bone stimulation of body weight. On the other hand, it is proved that in the process of engaging in aerobic exercise, middle-aged and elderly people should increase the amount of exercise within their ability to achieve better prevention and treatment effects.

4. Analyze the Problem and Propose the Concept

4.1. Design Purpose

To meet the needs of fitness personnel in carrying out fitness exercises and sports activities and the accompanying tool functions;

Change the stereotyped appearance of traditional fitness equipment, make it vigorous, improve people's exercise efficiency and comfort, make exercise personnel to use comfortable, healthy, efficient movement, make work become a kind of enjoyment;

For the exercise crowd every day monotonous, tedious office life to bring a little smile and relaxed.

4.2. Guiding Principles of Design

People oriented. In the design, the ergonomic data is taken as the basis, and the basic human scale, physical activity range and movement law are considered, otherwise, it is easy to bring inconvenience in operation and easy to work fatigue.

Security. From the choice of material to the design of the function, what should consider above all is its safety is eligible, whether can produce adverse effect to human body.

Flexibility of composition. Different from traditional fitness equipment single use, especially in the family commonly used small fitness tools. Generally, a piece of equipment is only a kind of exercise, which is not convenient enough. The combination of dumbbells and pullers gives the exerciser a refreshing feeling. Improved athletic efficiency, also be the person that exercise is taking cheerful mood to undertake fitness movement. The more flexible combination method, abandoned the traditional conformist way of thinking, I believe that will make the exerciser satisfied.

The application of new technologies. The application of adjustable magnetic force technology has changed the setting of traditional spring and the way of pulling force, and also made a new pattern in the market of pulling force. The adjustable magnetic technology is to connect the two parts of the puller together through magnetic force, and the user needs to pull it apart and close

with his own force. The beauty is that it can change the size of the force by changing the size of the magnetic force, which allows exercisers to exercise the fitness effects of different forces on one piece of equipment. In addition, different users have different strength. Such a device can meet the fitness requirements of exercisers with different strength, which is more convenient and practical.

5. Clear Conceptual Design Concept

The basic functions of modern small fitness equipment: to provide exercise, the basic needs of fitness; Aesthetic function; The design of appeal is changed, in order to satisfy the psychological demand of fitness crowd, reduce their working pressure, increase exercise appeal.

6. Determine the Plan for Improvement

6.1. Overall and Detailed Plan

This portable hand-held dumbbell type puller adopts the shape of dumbbell generally. There are glass covers on both ends of the dumbbell. After taking it off, the handle of the two side puller will be exposed, which means that the puller is ready for tension exercise. The yellow part of the front end of the dumbbell is a rotary switch with magnetic control options for exercisers to choose different strength levels. The greenest part of the dumbbell is the cushioning sponge, which is designed to prevent arm pain during stretching. This machine is easy in shape, more beautiful, not rigid, dynamic, a dual-use, plus the application of adjustable magnetic technology, I believe it will be loved by exercisers. (see figure 4-1)

The base adopts streamlined design, which is very lively and flexible. The support is supported in the middle of the dumbbells on both sides, instead of being clamped in the middle of the whole. Considering the problem of stable balance, such a design should be more secure, especially at home. Because the dumbbell itself is heavier, such unapt smash bad floor, won't fall more, as a result hurtful.

6.2. Color Scheme

Scheme 1: the scheme is mainly blue. Blue is one of the three primary colors, blue is very pure, usually people think of the sea, the sky, water, the universe. Pure blue shows a kind of beauty, calm, reason, serene with capacious. Because blue composed characteristic, have intellectual, accurate imago. At the same time, blue is also a high-tech, high-tech symbol.

Scheme 2: the scheme prefers red, which is also a kind of primary color. Red is the symbol of life, vitality, health, enthusiasm, vigor and joy. It gives people a feeling of youthful vitality, enthusiasm and enthusiasm, and positivity. Red and the black in the middle of the match, the achievement of a very match color - red and black color, give a person very comfortable, very eye-pleasing visual sense. And gules also very festival, be placed in the home very beautiful, the pro lai that this kind of plan can get a lot of female fitness person.

Scheme 3: the overall scheme is based on green. Green and nature and plants are closely related, there is a concept of environmental protection in it. Green is a very peaceful and kind color. Depict the small pure and fresh feeling with the most fashionable nowadays, when the user is exercising fitness, believing to be able to take very relaxed and comfortable feeling, this is helpful for fitness person better take exercise, have effect more.

7. The conclusion

As an indispensable tool in fitness activities, the role of fitness equipment has gradually evolved from a simple exercise tool to an important device for people to relieve pressure and relax. However, no matter at home or abroad, the design and development of fitness equipment has

always been aimed at male groups, and the products tend to be quantitative and large-scale, resulting in some users are not willing to use, or have a sense of disgust in the use process. In terms of appearance elements such as form and color, the meaning of existing equipment brought to people is cold, complex and cumbersome, and its visual image is easy to be associated with the hardships of exercise, so that it is difficult to muster up courage to carry out lasting exercise, affecting the effect of fitness.

The emotional design concept is introduced into the design of fitness equipment, with the purpose of enabling the product to trigger a certain emotion, adding a perceptual element to the design of fitness products, changing the existing image of fitness products, and making users happy to use fitness equipment and enjoy fitness activities.

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