Seesaw Rocker Designs for Ages 3 through 5
Proposal of Moving Toys for Kids in less-developed skill levels

Yukitoshi Hosono／Osaka Municipal College of Design

Introduction

A child's desire to play serves as an integral part of the child's physical and social development. Through play, the child learns new skills and enhances existing motor and social skills. In fact, when designing for children, the play environment is as important as those areas used for sleeping, eating and learning. Designing the play environment to meet these needs in a way that is safe, challenging, and fun is the formidable task that is presented to the designer. (1) Among moving toys for the infant there are Swings going back and forth (Including Tire Swings), Merry-go-rounds (Including All Rotating Equipment) Spring Rockers and Seesaws. Fulcrum seesaws are not recommended for children from age 2 to 5 because of the potential for a child to dismount without the foresight that it will cause the other child to abruptly hit the ground.. However, seesaws that are designed with spring centering devices (fig. 1) prevent this from occurring and are considered acceptable for ages 2 to 5.

The purpose of this study is to produce a safe, challenging, fun, and interactive moving toy. The main concern we have to consider is what is the most appropriate radius of the Rockers.

Conditions to make

fig. 1

1. 2 x 4 maple wood: 38-89-2440 mm. A little knotty but nice grain.
2. To produce for nursery school use with kids in the 3 to 5 age group.
3. Simple design that's easy to maneuver.
4. Safe and sturdy design.
5. tools: band saw, router, drill, sander, electric planer, circular saw, etc.
6. Repetitive testing of trial and feedback to achieve the appropriate radius of the runner.

Seesaw Rocker "Trial 1"

At first we determined the radius of the r ocker using the rocking chair's runner. We used a dual radius of the runner, but it wa s not efficient. It is impossible for the kid s to swing by sitting on the seat. This roc ker is 1,100 mm long and 300 mm wide and weighs 3 kg. (fig. 2)

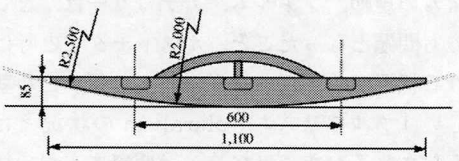

fig. 2

Seesaw Rocker "Trial 2"

This rocker is 1,000 mm long and 302 mm wide and weighs 2 kg. The Radius of 1,500

mm makes about 60 cm wide of center part of the Runner. The distance between footrest and seat was too short for the kids to sit down and pull on the Reins. Footrest was also too slender for two kids to put their feet on. (fig. 3)

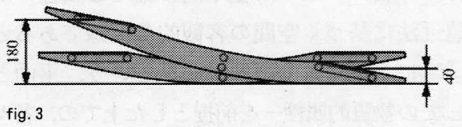

fig. 3

Seesaw Rocker "Trial 3"

This rocker is 1,000 mm long and 348 mm wide and weighs 3 kg. The distance between the lowest and highest position of the two seats is 310 mm in height. In comparison with Trial 2, this is more than twice the distance. (fig. 4)

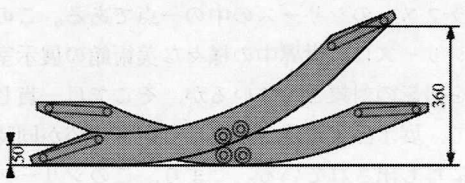

fig. 4

Evaluation criteria for Design of Seesaw Rocker "Trial 3"

We used the system-3 dimensional motion analysis system *VICON* (2) to analyze the behavior of two kids playing with this "Trial 3". We studied the following behaviors: 〈1〉 pull on reins, 〈2〉 hand in hand, and 〈3〉 hands free.

We received data of Average Velocity of kids' shoulder maker point in each behavior experiment.

Average Velocity (mm/sec) is an importa nt data to describe how kids use this tool and go ahead with their playing.

If the Average Velocity under 400 mm/sec, they can't feel a lot of fun and continue swinging rocker.

To the contrary, if the Average Velocity is over 700 mm/sec, it is too fast for kids to enjoy and interact with each other.

Conclusion

Kids need playthings that require the full-range of their developing faculties. Toys should be amusing, of course, but they should also engage and challenge a child's imaginative and problem-solving skills. The results of this study indicate objectively to us how kids respond in playing with these moving toys. To my understanding, we subjectively evaluated the design of this type of moving toy only using words like pleasant, fun, and exciting. After conducting this experiment we are convinced that the radius of the runner is very important in relation to the Absolute Velocity of swinging speed. Yet, if we use a shorter radius, the swinging speed will increase and kids will become too frightened to continue.

It is strongly recommended that play tools for kids in the 2 to 5 age group are created distinctly different from tools for older kids. Some types of equipment may be used with modifications that take into account their reduced range of motion and less-developed skill levels.

We can now measure the developmental needs as well as the radius of the Rocker. We needed to design a play tool to fit a wide range of kids.

References:

(1) Design Standards for Children's Environments, Linda Cain Ruth, (2000) The McGraw-Hill Co.,Inc.

(2) *VICON* 370 Systems, Oxford Metrics Limited, 14, Minns Estate West Way Oxford OX2 OJB