Domestic Snowboard Gaming Machine

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Introduction

City life is hectic, and many people exercise in their free time. Especially on holidays, some people would choose to engage in outdoor activities. But outdoor activities are easily affected by external factors, such as the weather.

In the recent decade, home exercising is popular, and many people will buy lightweight exercise equipment. Affected by the covid-19 pandemic, people are more concerned about exercise and health. Even people who have no exercise habits will also buy exercise-related smart products not only for fitness but also for entertainment and leisure.

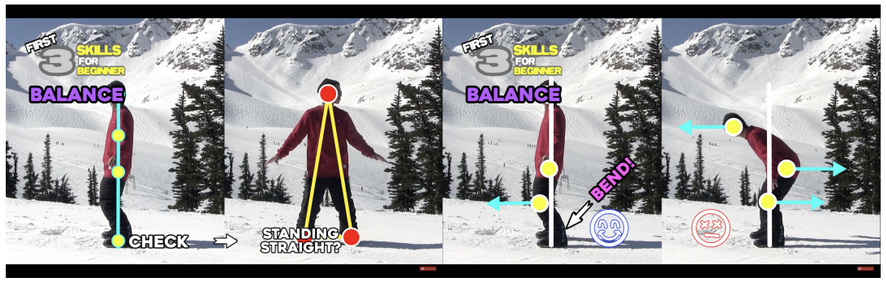
Skiing is an outdoor activity as well as a seasonal activity. It is a high-consumption activity for people in non-snowing areas. Therefore, every moment of skiing is precious.

The project aims to design a product, small-scale home ski equipment, to bring outdoor activities such as skiing into the home so that people can enjoy skiing at any time.

Snowboarding

Snowboard equipment is simpler than ski equipment
Only need a snowboard

Principle of training



Standing Posture
1)Feet-Shoulder width apart
2)Simulate kneeling forward and then knees slightly flexed
3)Head facing forward, in line with shoulders, hips, and ankles

Turns Around & Stop
1)Relax & Bend your ankles
1)Put the snowboard down to heel-side or toe-side
2)Rotate the whole body to the ideal side

Stance & Balance
1)Keep the centre in the middle(between the feet)
2)Small bounce when slipping for checking

Speed Control
1)Skidding to slow down or make it stop
2)Stand lower and lower the center to accelerate

Routine Practice

T

Technical training

- Snow parks or indoor ski resorts for skiing.
- Activities of similar nature, eg. skateboarding

P

Physical training

Focus 6 categories:

- Flexibility
- Balance
- Stability
- Endurance
- Speed and power
- Coordination & Reaction speed

M

Mental Management

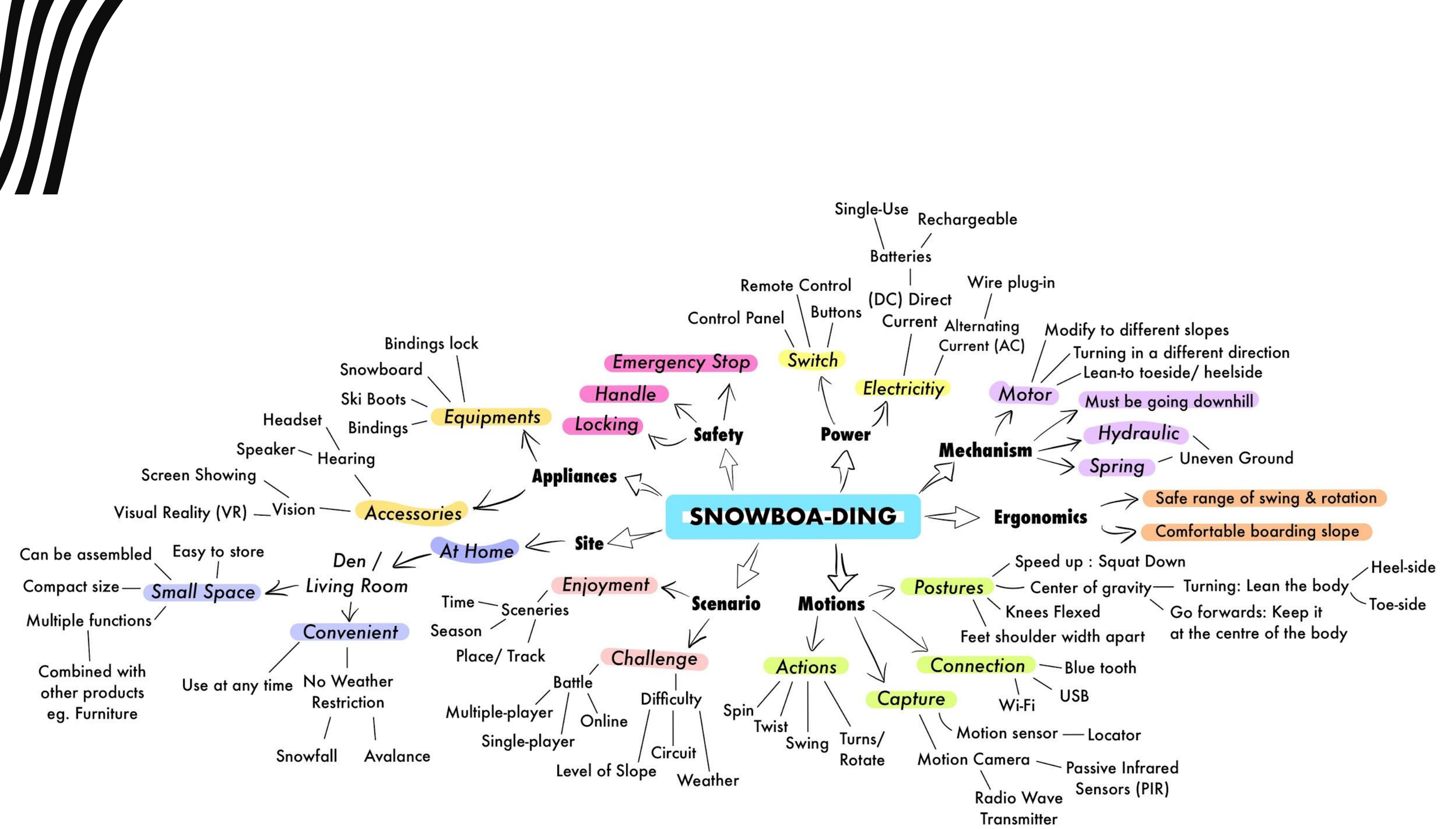
- Motor learning
  Watching teaching videos & live skiing videos can absorb useful information & cultivate the senses through visualisation.

Target audience

- Adults
- Beginner /Junior Snowboarders
- To keep their fitness & muscle strength
- Practice the snowboarding basic skills

User analysis and needs

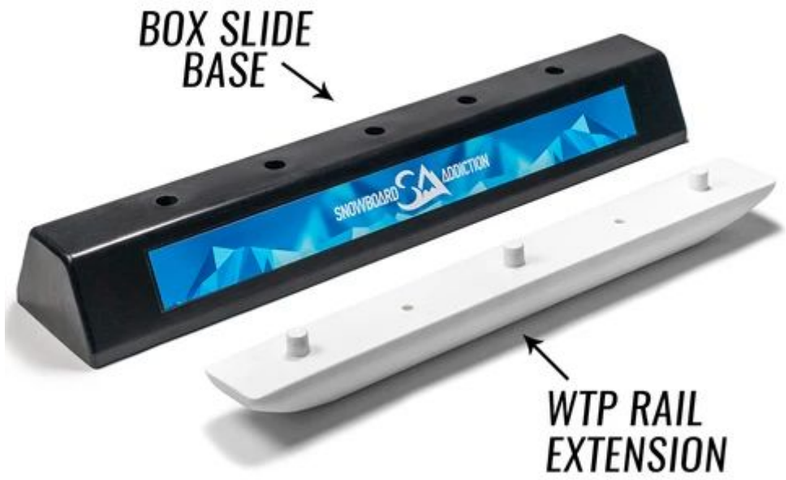
1. It needs to be considered for people of different ages or body types.
2. Mode conversion :
    A single-player mode VS multiplayer mode
    Hardware VS software
3. Analytical systems and supporting facilities :
    Analyse & Correct the user’s posture.
4. Consider different types of tricks
    The flexibility the equipment brings to the user needs to be higher, especially the use of core muscles and lower limbs.
5. To bring the user a real skiing experience
    Eg. visual simulation of scenery
    Eg. touch Experience different slopes at home, or achieve a turning effect.


SNOWBOA-DING
Appliances
Equipments
Bindings lock
Snowboard
Ski Boots
Bindings
Headset
Speaker
Hearing
Screen Showing
Visual Reality (VR)
Vision
Accessories
Safety
Emergency Stop
Handle
Locking
Power
Switch
Remote Control
Control Panel
Buttons
Electricitiy
Single-Use
Rechargeable
Batteries
(DC) Direct Current
Wire plug-in
Alternating Current (AC)
Mechanism
Motor
Modify to different slopes
Turning in a different direction
Lean-to toeside/ heelside
Must be going downhill
Hydraulic
Spring
Uneven Ground
Ergonomics
Safe range of swing & rotation
Comfortable boarding slope
Site
At Home
Den / Living Room
Small Space
Can be assembled
Easy to store
Compact size
Multiple functions
Combined with other products eg. Furniture
Convenient
Use at any time
No Weather Restriction
Snowfall
Avalance
Scenario
Enjoyment
Time
Sceneries
Season
Place/ Track
Challenge
Battle
Multiple-player
Single-player
Online
Difficulty
Level of Slope
Circuit
Weather
Motions
Actions
Spin
Twist
Swing
Turns/ Rotate
Postures
Speed up : Squat Down
Center of gravity
Turning: Lean the body
Heel-side
Toe-side
Go forwards: Keep it at the centre of the body
Knees Flexed
Feet shoulder width apart
Connection
Blue tooth
Wi-Fi
USB
Capture
Motion sensor
Locator
Motion Camera
Passive Infrared Sensors (PIR)
Radio Wave Transmitter

Product/Technology/Mechanism

Snowboard Addiction

Balance Bar



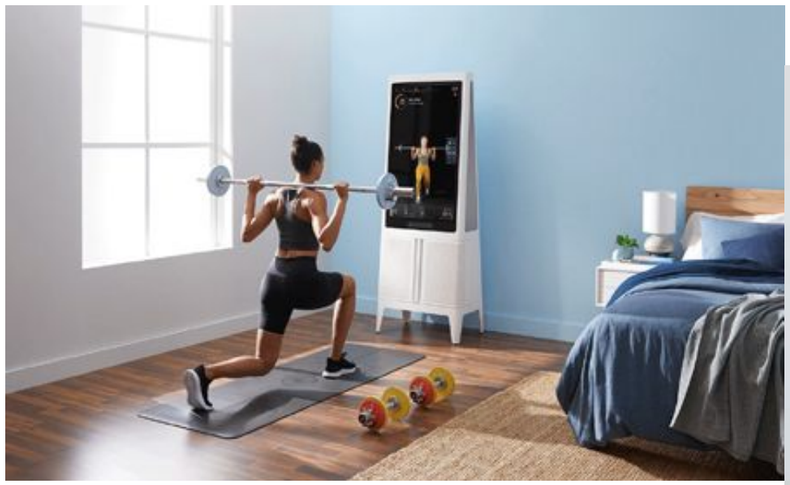
A trapezium bar with an additional half cylinder bar on top

For technique training

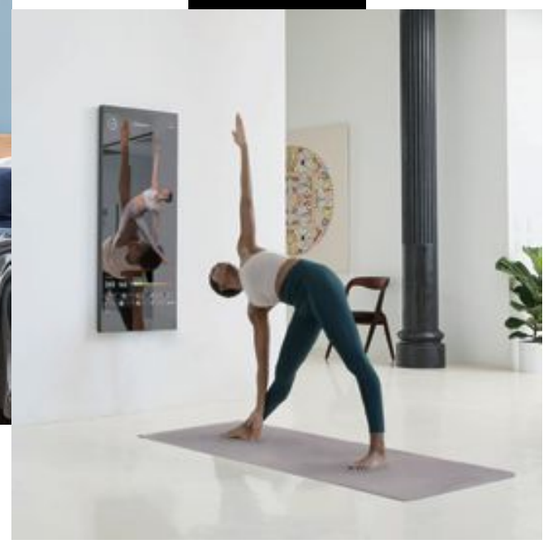
Material : 100% Plastic Recycled

Tempo

Mirror



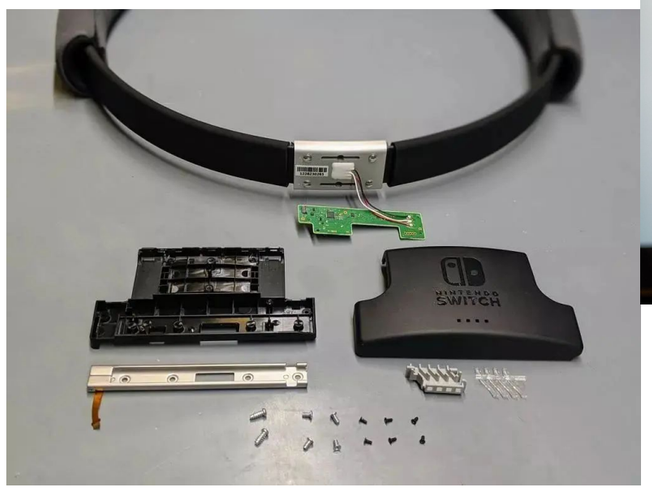
An upright display with motion camera



Product/Technology/Mechanism

Nintendo

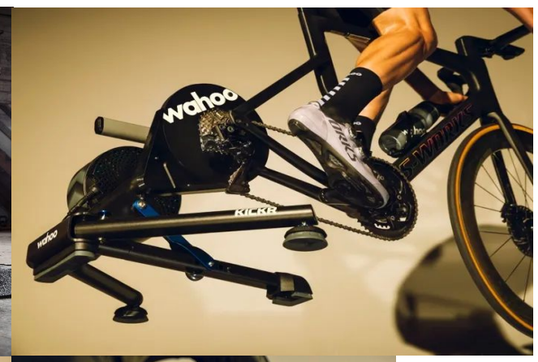
Switch Ring-Fit

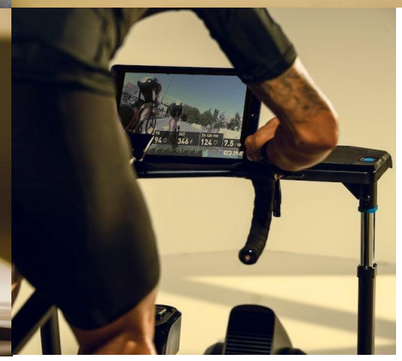


Using motion sensor & locator
to track and analyze the movement

Wahoo

Kickr





The CLIMB has a ramp regulator

The Kickr features a pre-installed 11-speed cassette, multiple axle configurations

ANT+ and Bluetooth® capabilities allow the KICKR to connect to smartphones, GPS devices, and FE-C enabled devices or applications.

Materiala : Steel

Product/Technology/Mechanism

Security alarms

Technology has long played a key role in protecting homes and other buildings from intruders and burglaries. Modern alarm systems use various sensors to detect intruders, for example by picking up their body heat or pressure from their footsteps, or by responding to changes in the positions of doors or windows.

Passive infrared sensors

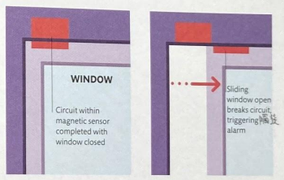
Everyone gives off infrared radiation at differing levels to their surroundings. Passive infrared (PIR) sensors detect changes in infrared emissions using thin layers of pyroelectric film. This film absorbs infrared radiation, which causes it to heat up and generate small electrical signals. A change in infrared levels across multiple areas of a room can signal the presence and movement of an intruder.

Movement detection
As an intruder moves across a room, he or she crosses different zones. The sensor picks up changes in infrared levels across the zones to detect movement.

WHERE IS THE BEST PLACE TO PUT A SECURITY SENSOR?
Choke points, such as hallways, where people have to pass through, are good locations, as are corners of rooms offering coverage of multiple entry points.

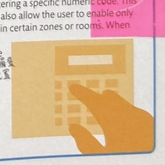
Contact sensors

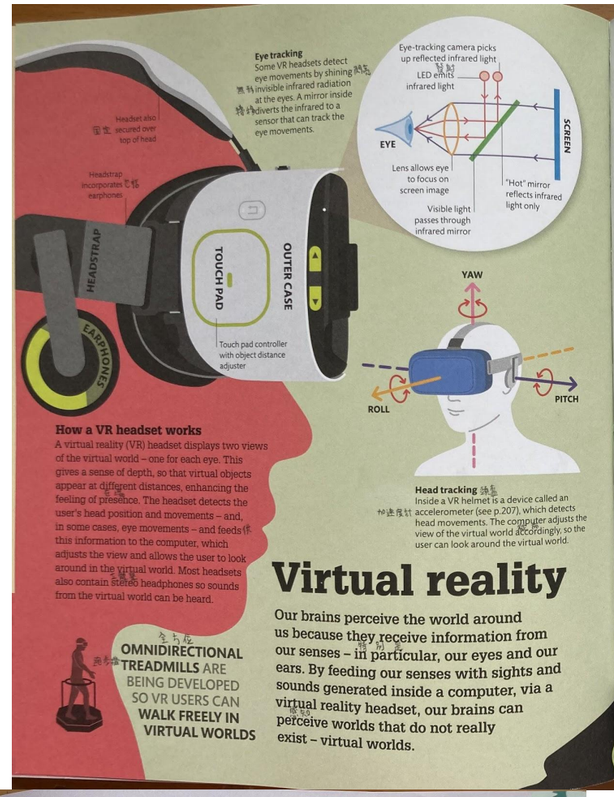
The two parts of a magnetic contact sensor – one part fitted to a door or window, the other to its fixed frame – complete an electric circuit when closed. When the door or window is opened, and the contact between the two magnets is broken, the circuit is also broken. This sends a signal to the security alarm's controller, which interprets this as a possible unexpected entry.



34 per cent
THE PROPORTION OF **BURGLARS** WHO ENTER THROUGH THE **FRONT DOOR**

CONTROL PANEL
An alarm system's controller enables the user to arm or disable the system by entering a specific numeric code. This central control point can also allow the user to enable only the security systems within certain zones or rooms. When armed, the controller monitors data sent by the sensors and, if triggered, sounds alarms, deploys any electronic locks, and may use wireless links to alert security guards or the police.





Eye tracking
Some VR headsets detect eye movements by shining invisible infrared radiation at the eyes. A mirror inside diverts the infrared to a sensor that can track the eye movements.

How a VR headset works
A virtual reality (VR) headset displays two views of the virtual world – one for each eye. This gives a sense of depth, so that virtual objects appear at different distances, enhancing the feeling of presence. The headset detects the user's head position and movements – and, in some cases, eye movements – and feeds this information to the computer, which adjusts the view and allows the user to look around in the virtual world. Most headsets also contain stereo headphones so sounds from the virtual world can be heard.

Head tracking
Inside a VR helmet is a device called an accelerometer (see p.207), which detects head movements. The computer adjusts the view of the virtual world accordingly, so the user can look around the virtual world.

Virtual reality

Our brains perceive the world around us because they receive information from our senses – in particular, our eyes and our ears. By feeding our senses with sights and sounds generated inside a computer, via a virtual reality headset, our brains can perceive worlds that do not really exist – virtual worlds.

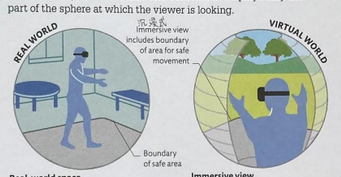
OMNIDIRECTIONAL TREADMILLS ARE BEING DEVELOPED SO VR USERS CAN **WALK FREELY IN VIRTUAL WORLDS**

AUGMENTED REALITY

A technology closely associated with VR is augmented reality. Typically used on a smartphone or tablet, an augmented reality app adds virtual objects into the live view from the device's camera. In this way, virtual objects appear in the real world. This can be useful in adventure games, or in displaying information about buildings or vehicles in the real world.

Virtual worlds

The scenes that can be explored inside a VR headset are stored inside a computer. Most virtual worlds are created using computer-generated imagery (CGI) with three-dimensional modelling software that creates digital representations of the virtual objects and surfaces. The scene exists as a sphere, with the viewer at the centre and objects all around. The VR headset displays only the part of the sphere at which the viewer is looking.

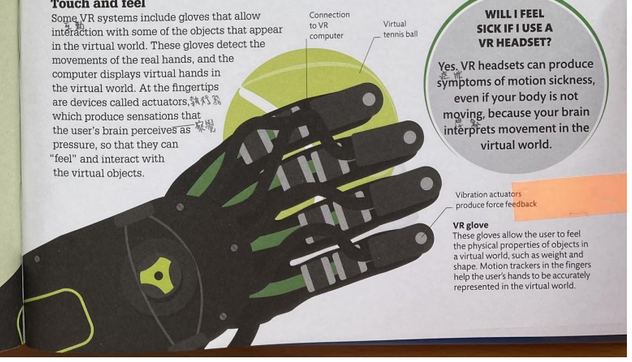


Real-world space
The real-world location can be anywhere – in a room, in a field, or on the beach. A VR headset blocks out the sights, and often the sounds, of the real world.

Immersive view
The screens inside the headset display a scene from a virtual world, and stereo headphones play virtual sounds, so that the user feels as if they are really there.

Touch and feel

Some VR systems include gloves that allow interaction with some of the objects that appear in the virtual world. These gloves detect the movements of the real hands, and the computer displays virtual hands in the virtual world. At the fingertips are devices called actuators, which produce sensations that the user's brain perceives as pressure, so that they can "feel" and interact with the virtual objects.



WILL I FEEL SICK IF I USE A VR HEADSET?
Yes. VR headsets can produce symptoms of motion sickness, even if your body is not moving, because your brain interprets movement in the virtual world.

VR glove
These gloves allow the user to feel the physical properties of objects in a virtual world, such as weight and shape. Motion trackers in the fingers help the user's hands to be accurately represented in the virtual world.

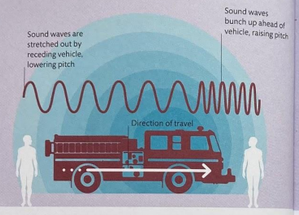
Speed cameras

Many types of speed camera use radar (see pp.48–49) to measure the speed of a vehicle. They transmit radio waves at a vehicle and use the waves reflected back to calculate its speed.

A REVIEW OF 35 INTERNATIONAL STUDIES FOUND THAT SPEED CAMERAS REDUCE AVERAGE SPEEDS BY UP TO 15 PER CENT

The Doppler effect

When radio waves strike a vehicle that is moving towards or away from a transmitter, such as a speed camera, the vehicle's motion changes the wavelength of the reflected waves. This change is called the Doppler effect. The same effect makes an emergency vehicle's siren rise in pitch as the vehicle approaches and fall in pitch as it moves further away.



How a speed camera works

A speed camera sends out bursts of radio waves and then detects the waves that are reflected back from a moving vehicle. It uses differences between the transmitted and reflected waves, caused by the Doppler effect, to determine the vehicle's speed. The very short radio waves emitted by a speed camera are called microwaves. They are about a centimetre long and travel at the speed of light.

1 Transmission
The camera's radar unit transmits a beam of microwaves, which fans out across the road. Less than a microsecond (one millionth of a second) later, the waves reach the back of the passing vehicle.

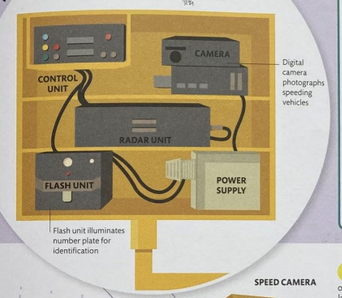
2 Reflection
The microwaves bounce off the vehicle's bodywork like light bouncing off a mirror. The curved shape of the vehicle sends the reflected waves away in all directions.

Microwaves transmitted by speed camera

Motion of vehicle stretches reflected radio waves

Fixed speed cameras
The greater the difference in wavelength between the waves transmitted by the speed camera and the waves reflected back by the vehicle, the faster the vehicle is travelling.

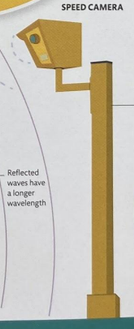
INSIDE A SPEED CAMERA
A speed camera houses a radar unit, camera, power supply, and control unit. It usually points at the backs of vehicles, so that the flash of the camera does not dazzle drivers.



LIDAR

Some handheld speed detectors fire a series of laser pulses at vehicles and measure the return time of reflected pulses to calculate a vehicle's distance and speed. This technique is known as LiDAR (Light Detection and Ranging).

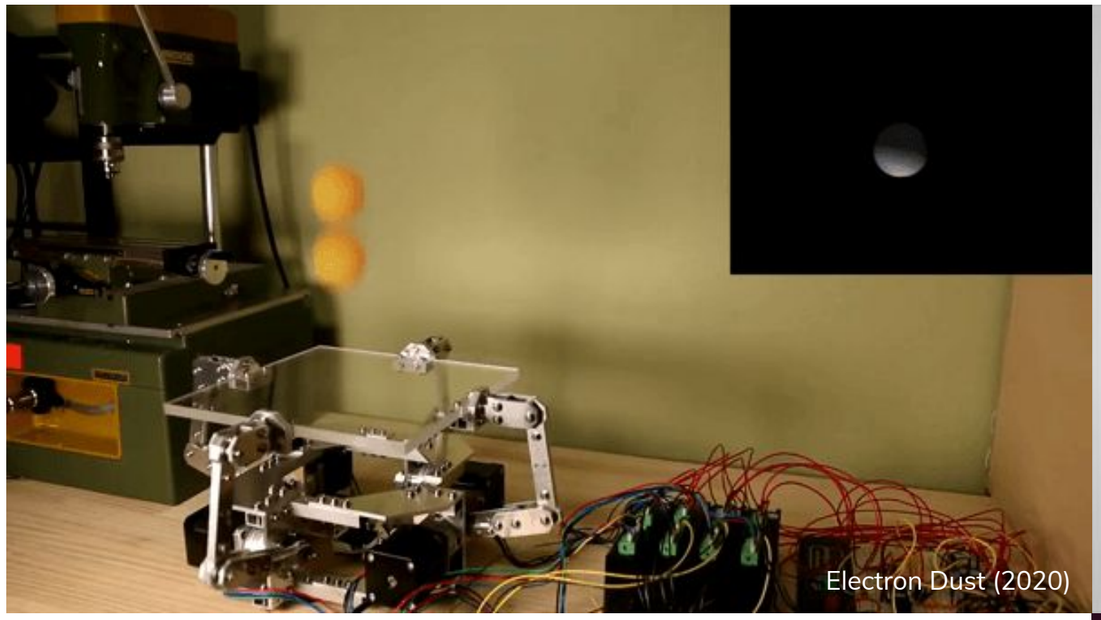
SPEED CAMERA



3 Reception
The radar unit receives some of the reflected microwaves. If their longer wavelength indicates a speed above the speed limit, a digital camera is activated to photograph the car.

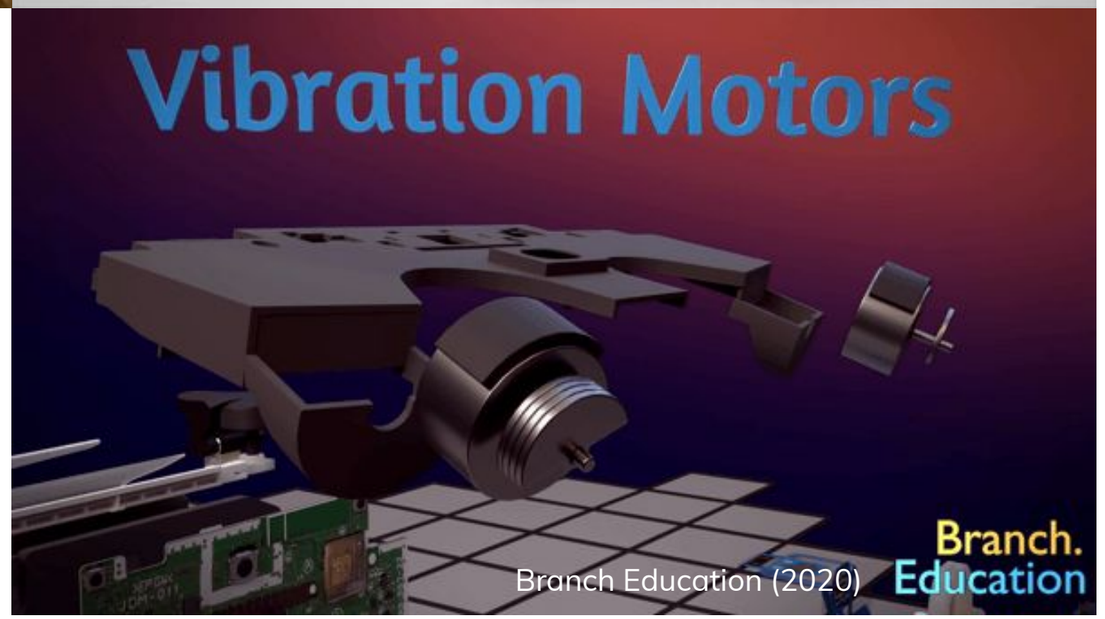
WHEN WERE SPEED CAMERAS INVENTED?
Although the idea of developing speed cameras dates back to at least the early 1900s, the first radar speed cameras were made in the US for military use during World War II.

Product/Technology/Mechanism



Electron Dust (2020)

Standa Ltd. (2017)



Branch Education (2020)

Design Criteria

1. Adjustable slope to match with different route of different ski resort
2. How to know you are getting wrong positions or will have emergency ?
3. Can swing left and right on the X axis to simulate heel-side or toe-side slipping
4. How do the Players see the details of their performance?
5. Can it interact with third-party players
6. Use with original snowboard equipment

Snowee

A domestic snowboarding VR gaming machine

Vibration motor

When you get hitting/
meet uneven ground
it will be shaking.

Hydralic arm

Electric hydralic arm having adjustion that
the inclination can change to different levels.

Snowee

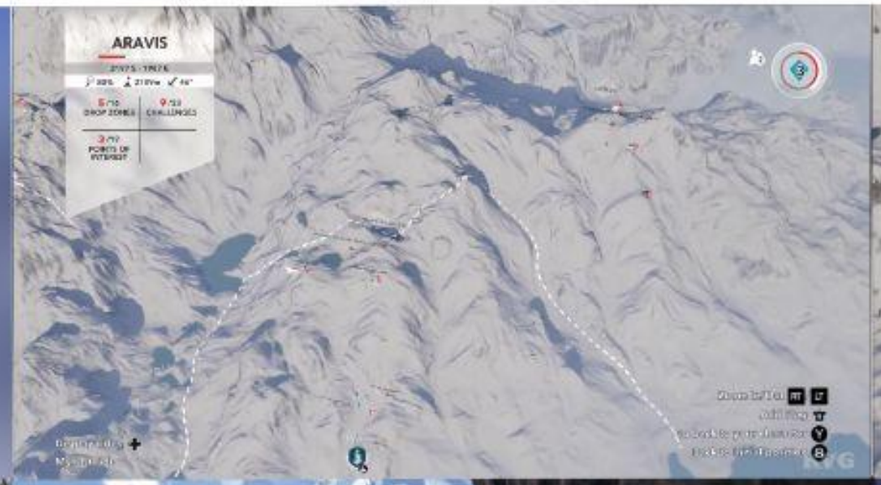
You can enjoy snowboarding anytime and anywhere.
To warm up before going to play snowboard,
save time and save money.

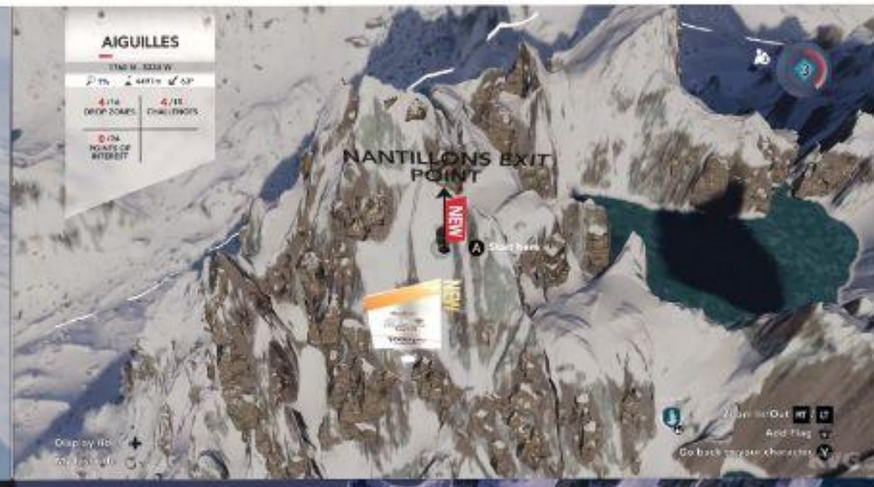
There are adjustable of the slope, you can learn
and practise the basic skill of snowboarding.

It can connect to other players
to have a competition or an adventure.

There are handles that you can hold on to when you
stand as unstable and when you setting foot on it.

The stair will move up after you stand well
and move back to the origin when you swift it off.


ARAVIS


AIGUILLES
NANTILLONS EXIT POINT
NEW

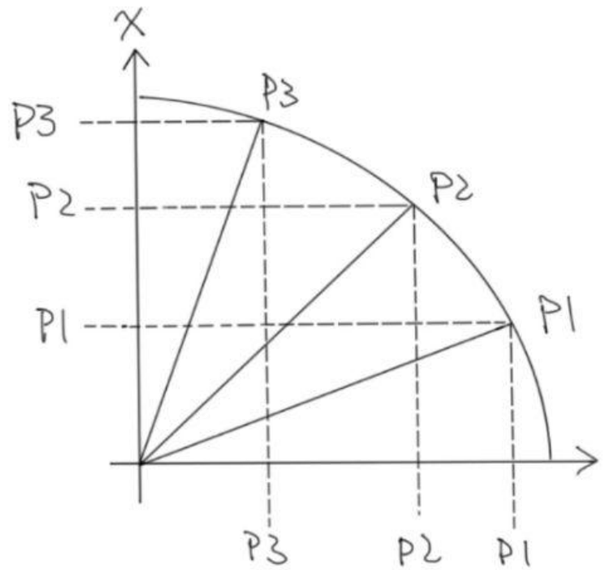

+666
X2


100 XP
+1050
X5


4132
X5

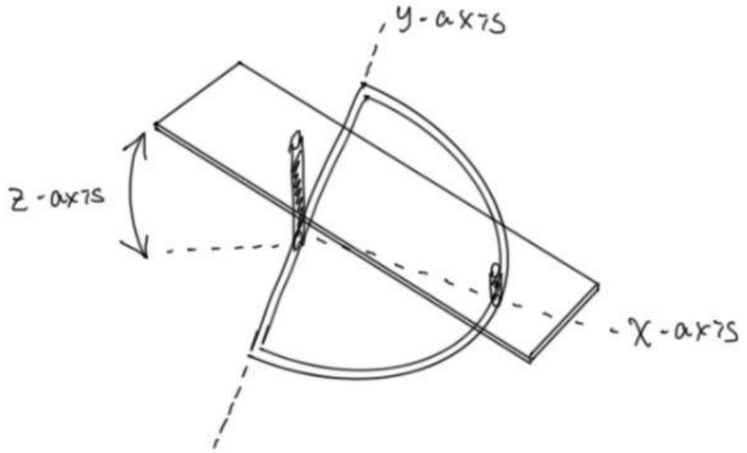
Expected Future Development

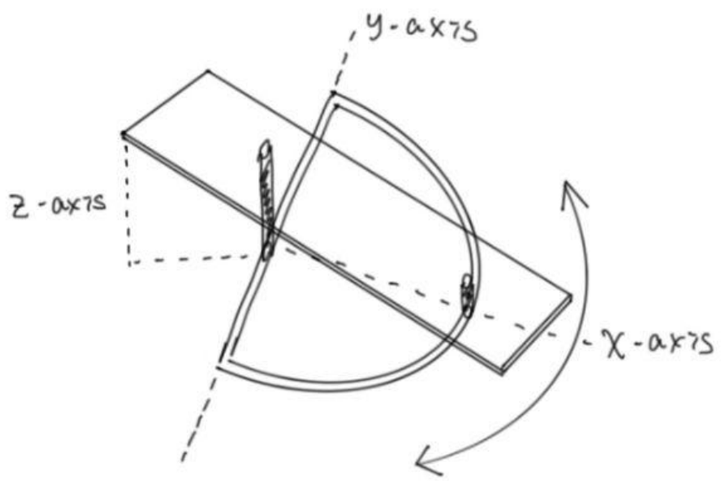
Position Changing

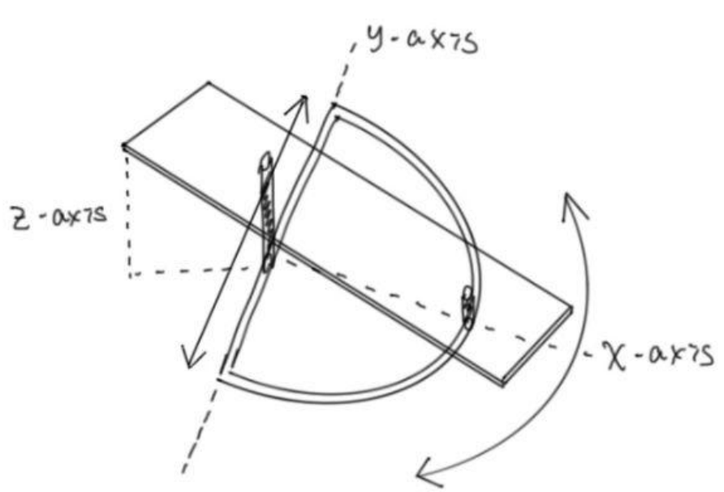


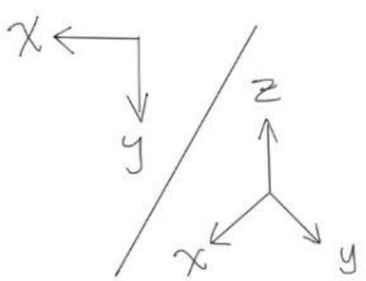
On → z, xy unchange

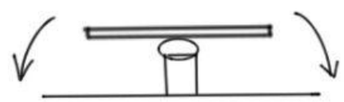
Run/Stop → xy, z unchange

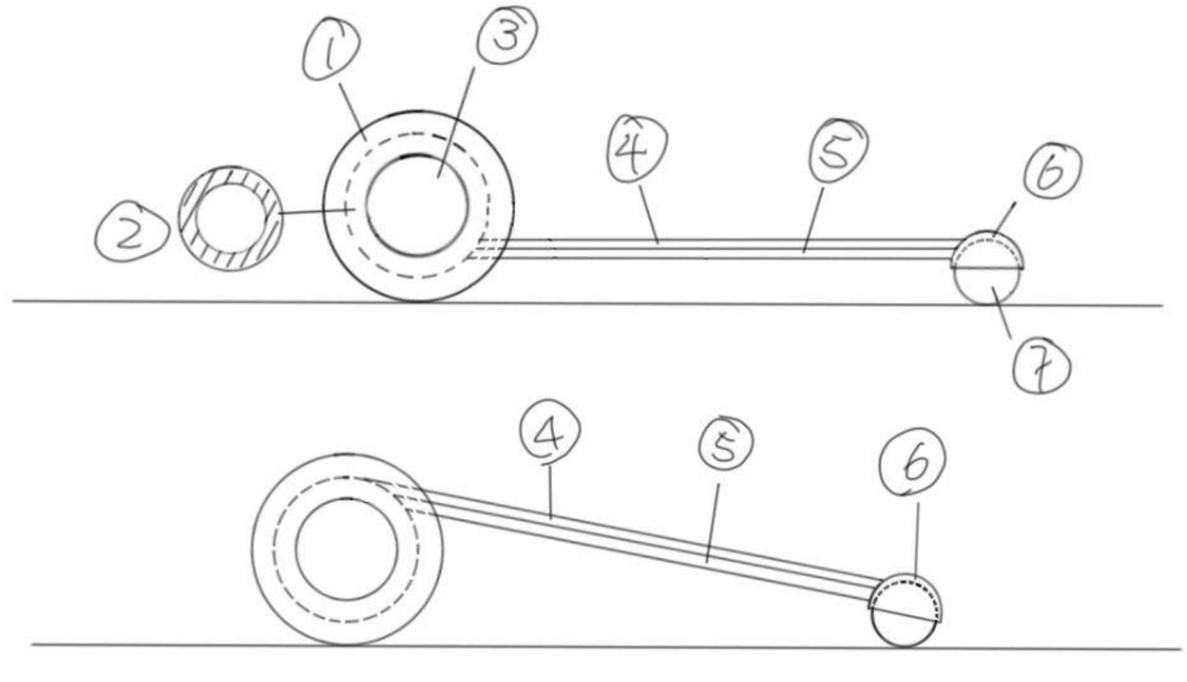








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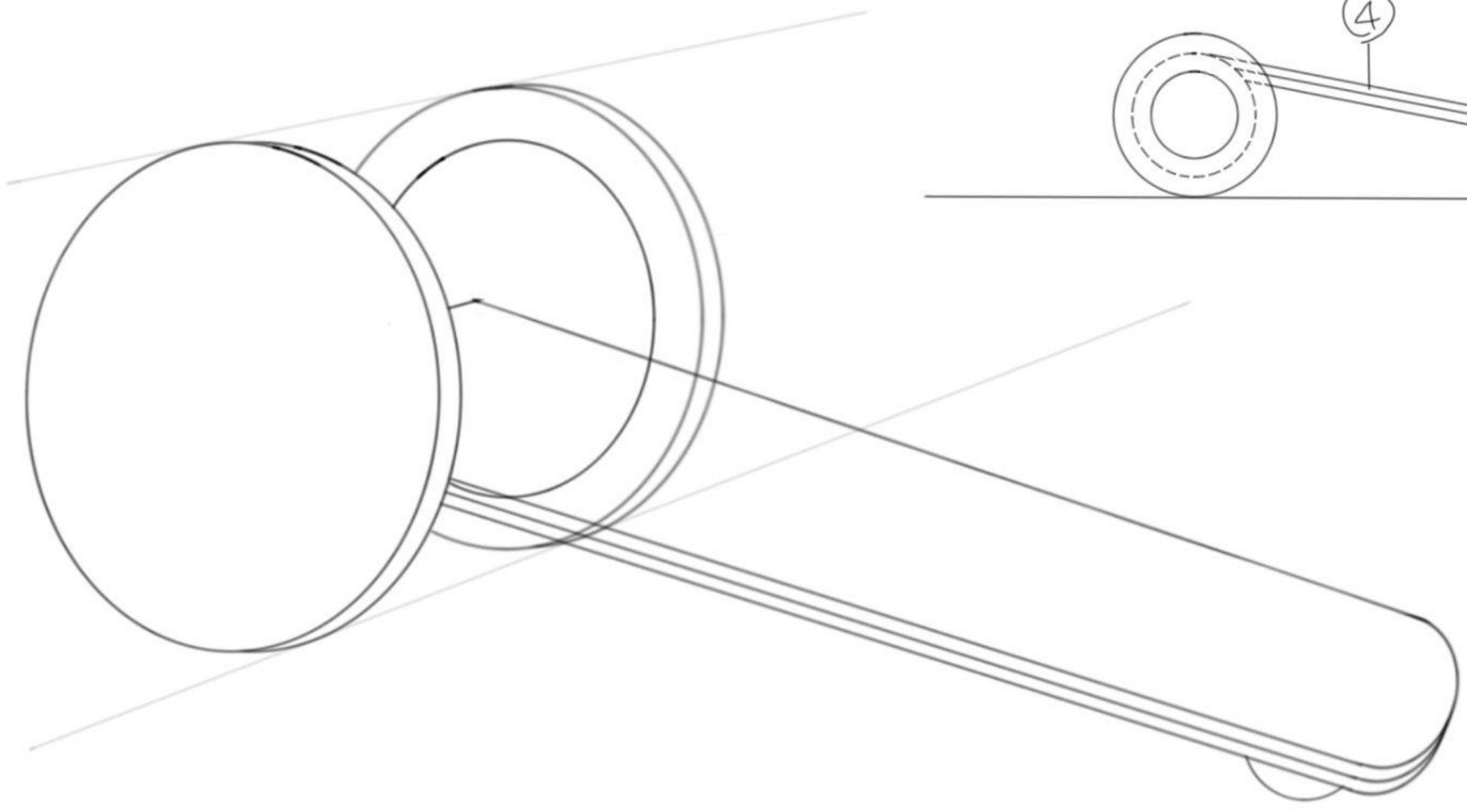

Thanks for watching !