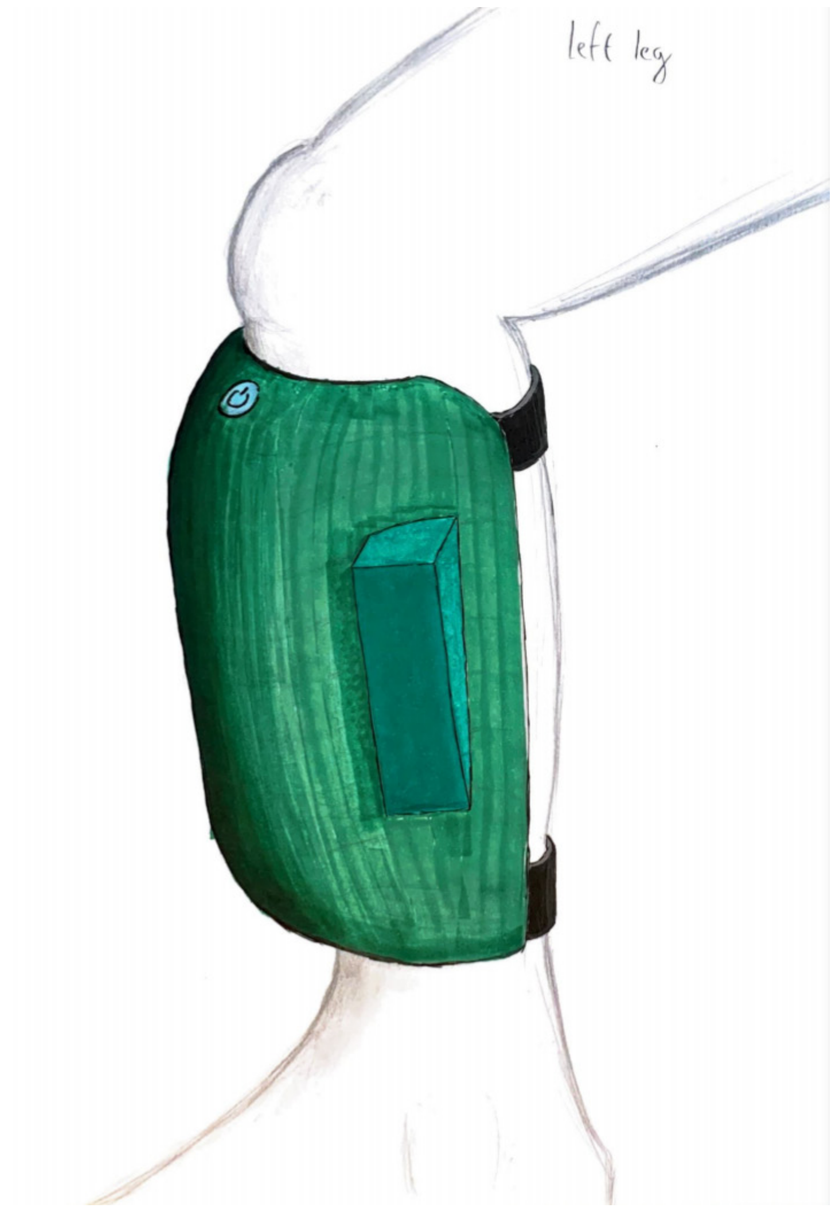
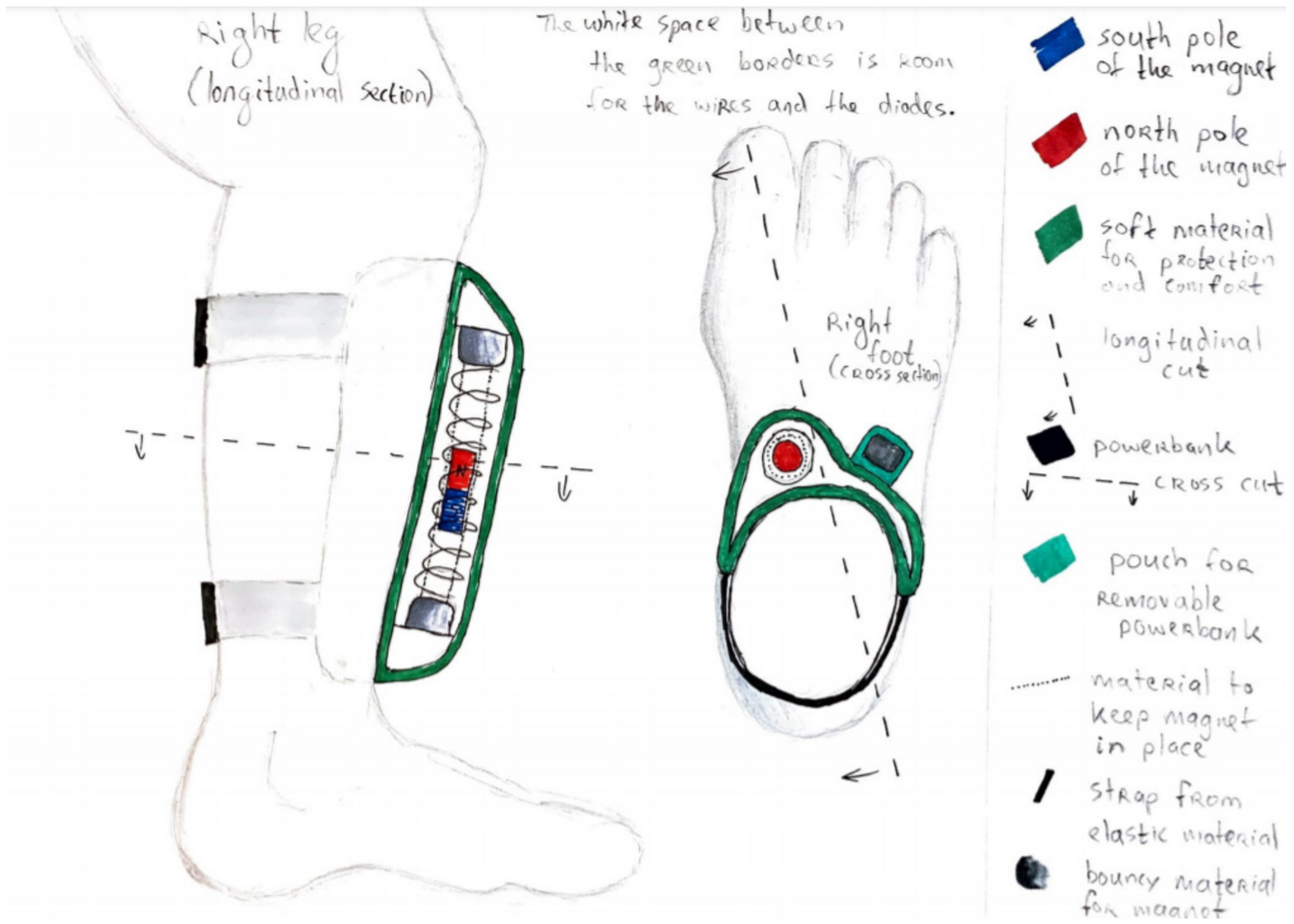
KINELEGTRIC

ENERGY EFFICIENCY ASSIGNMENT, TOM UIJLENHOET



FINAL SKETCH



LONGITUDINAL AND CROSS SECTION

Design process

Start: Where are energy inefficiencies?
- Not all kinetic energy is harvested and used, e.g. kinetic energy generated during sport, wind and tidal energy
- Not all solar energy is harvested and used, e.g. on artificial surfaces like roofs and roads
- Not all potential energy is used, e.g. as energy storage
- Energy store and transportation

Approach:
- Think of examples in daily life where energy is generated but not harvested and used: rain through downspout, gym, trampoline park, wind generated by truck movement, climbing and descending stairs, walking, running, cycling

Conclusion:
- Interest to transform kinetic energy into electrical energy/energy storage

Which kinetic energy should the design transform?
- Energy generated during sports: gym, cycling, running, walking

Should the design be integrated into the training device or should it be a portable device?
- A portable device because it is multifunctional in different places and situations (incl. school and office) to increase impact

Should the design be attached to the training device or to the person who sports?
- A design attached to the person who sports because the human body is more uniform than different training devices

To which part of the body should the design be attached?
- Portable device attached to the lower leg because that part can also move while being seated (at school, in the office)

Different perspectives in design process

Users:
- Sportsmen
- But also students and office workers

Impact to achieve:
- Capture kinetic energy (while doing sport) that otherwise would be lost
- Stimulate people to move more

Qualities of the design:
- Portable energy transformer combined with removable power bank
- Optimal size and weight in correlation to transformation efficiency
- Easy to use, thus no special intelligence of user required

Modalities:
- Minimal noise
- Color suitable for sustainable energy
- Sleek design
- Soft, not irritating interface with body contact

Technology to use:
- Magnetic inductive coil mechanism to transform kinetic energy into electrical energy

Different perspectives of design

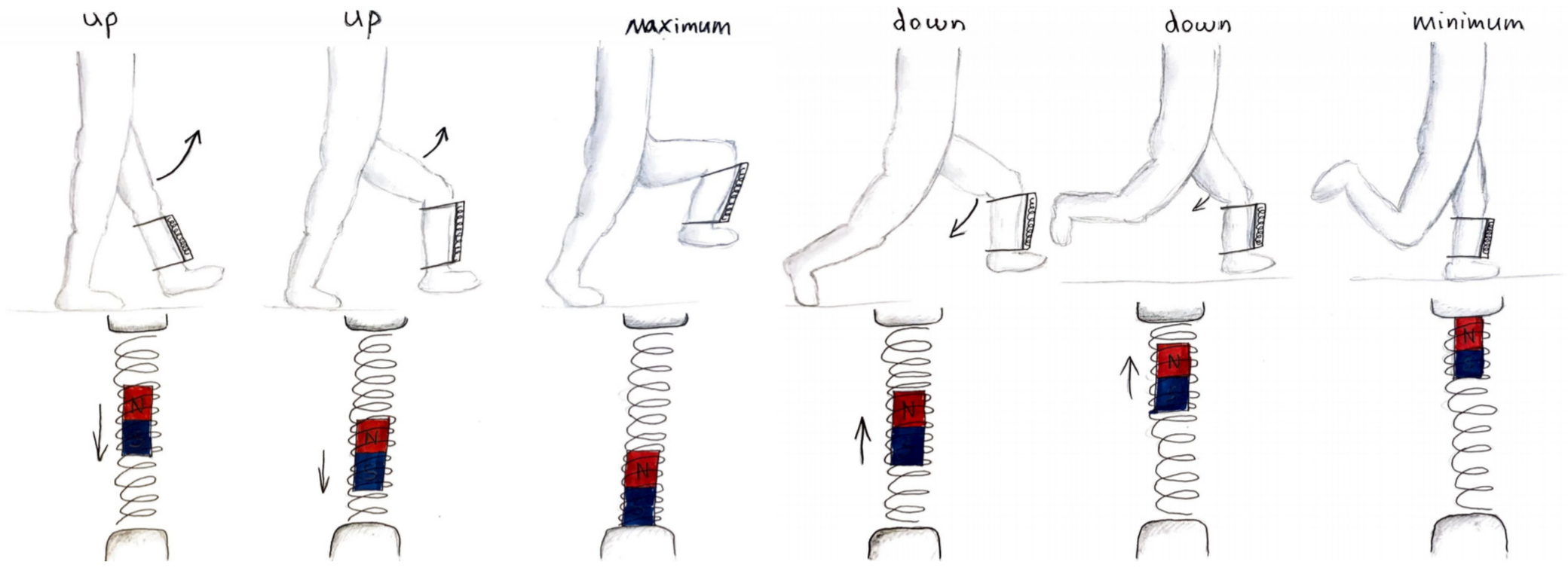
Production of the design:
- Buy magnetic inductive coil and power bank modules and assemble to kind of shin guards

Company taking design to market:
- Nike or other sport wear producers
- Apple or other digital watch manufacturers

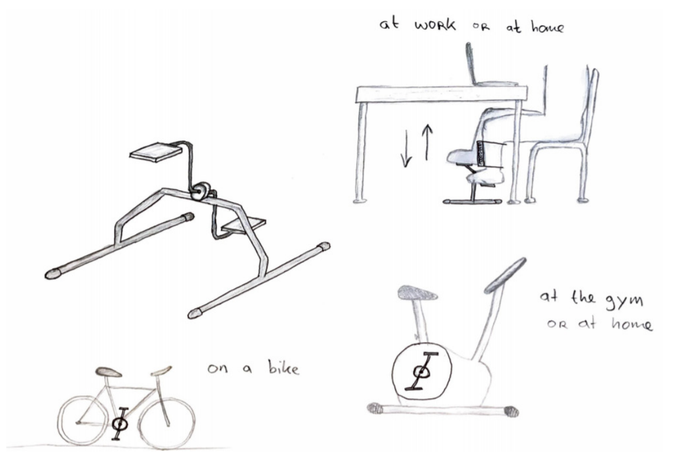
Competitors of portable kinetic energy transformers:
- On the market: kinetic shoe sole by Nike, Vibram, etc.
- In development: knee brace by American military, bracelets

Efficiency of the design:
- Magnetic strength and amount of inductive coils in series determine efficiency

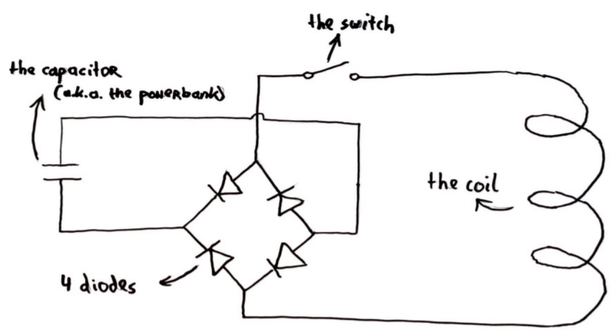
Impact of the design:
- Energy efficiency: kinetic energy that otherwise would be lost is captured
- Health impact: stimulate more movement at school & in the office



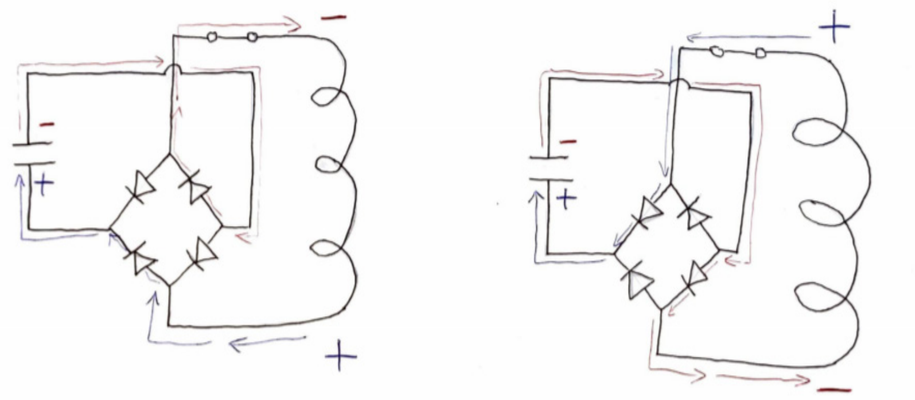
MAIN MECHANISM OF DEVICE



USEBILITY



ELECTRICAL SCHEME



SCHEMATIC REPRESENTATION MECHANISM