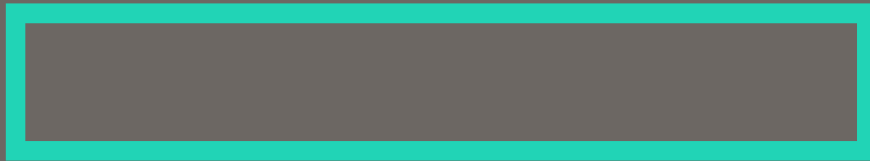


마루 위 꼬물이



한양대학교 미래자동차공학과
2020005387 임규빈 (조장)
2020054775 이재홍
2020001267 김정태

마루 위 꼬물이

로봇 청소기

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2020054775 이재홍
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주제 (로봇 청소기)

주제 선정 이유 및 로봇 청소기의 정보를 중심으로



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02

주제



팀명 소개

01



모델링 과정

03

04

키네마틱 영상



참고문헌

05

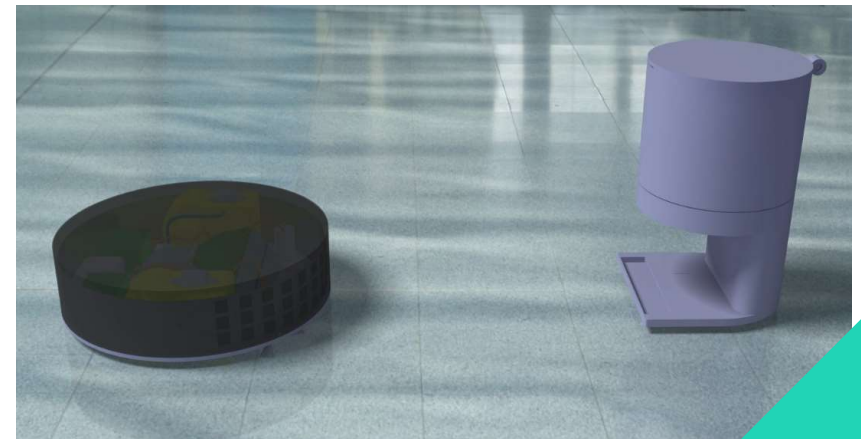
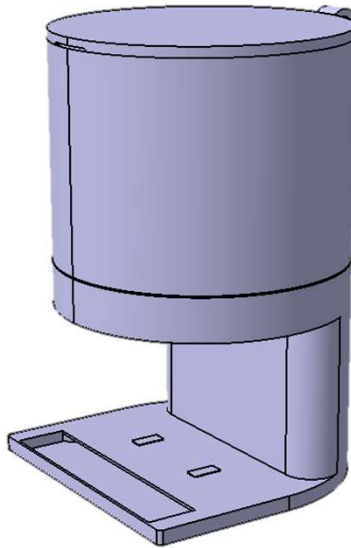
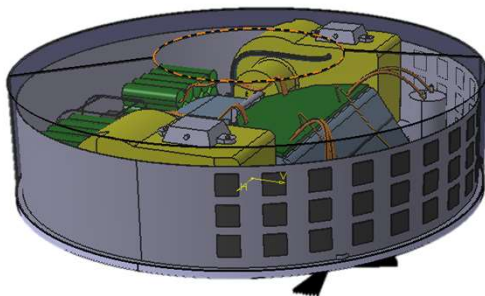
01



주제 & 팀명 소개

로봇 청소기

마루 위 꼬물이



02



주제 선정 이유



로봇 청소기의 시장 증가



문제점 개선

02



시장의 증가

국내 로봇청소기 시장 규모 (단위:대)

※2021년은 추정치 자료:업계



GLOBAL ROBOTIC VACUUM CLEANER MARKET 2021-2025

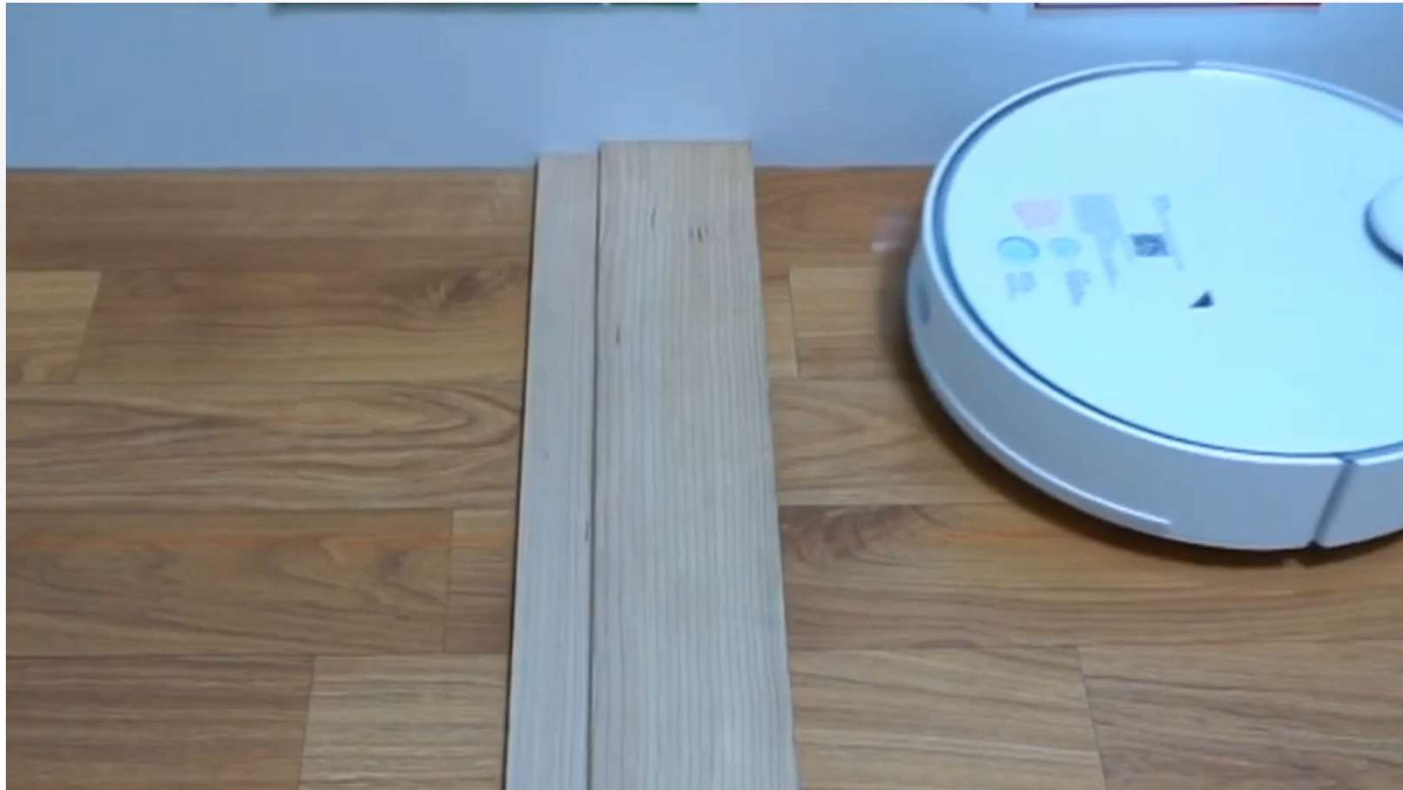


17000+ Reports covering niche topics. Read them at [technavi](#)

02



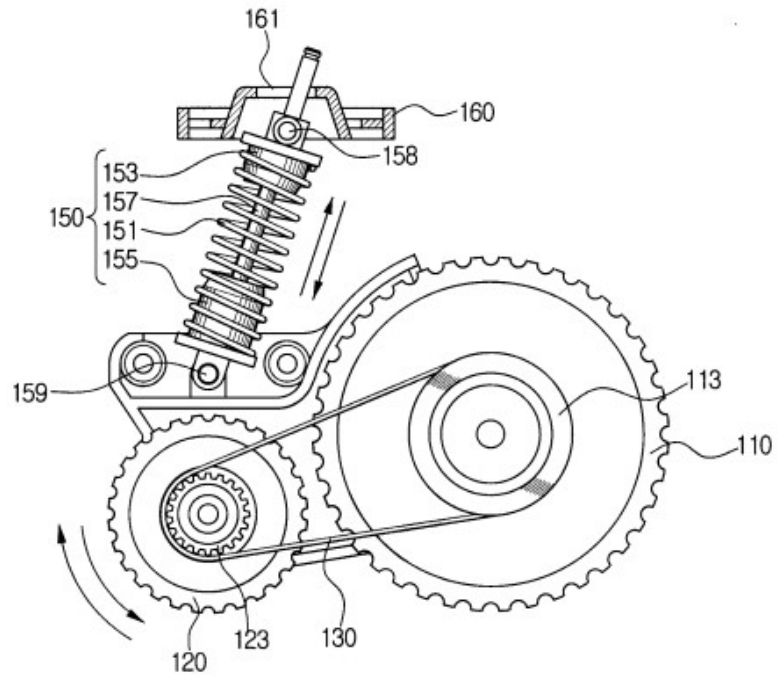
문제점



02



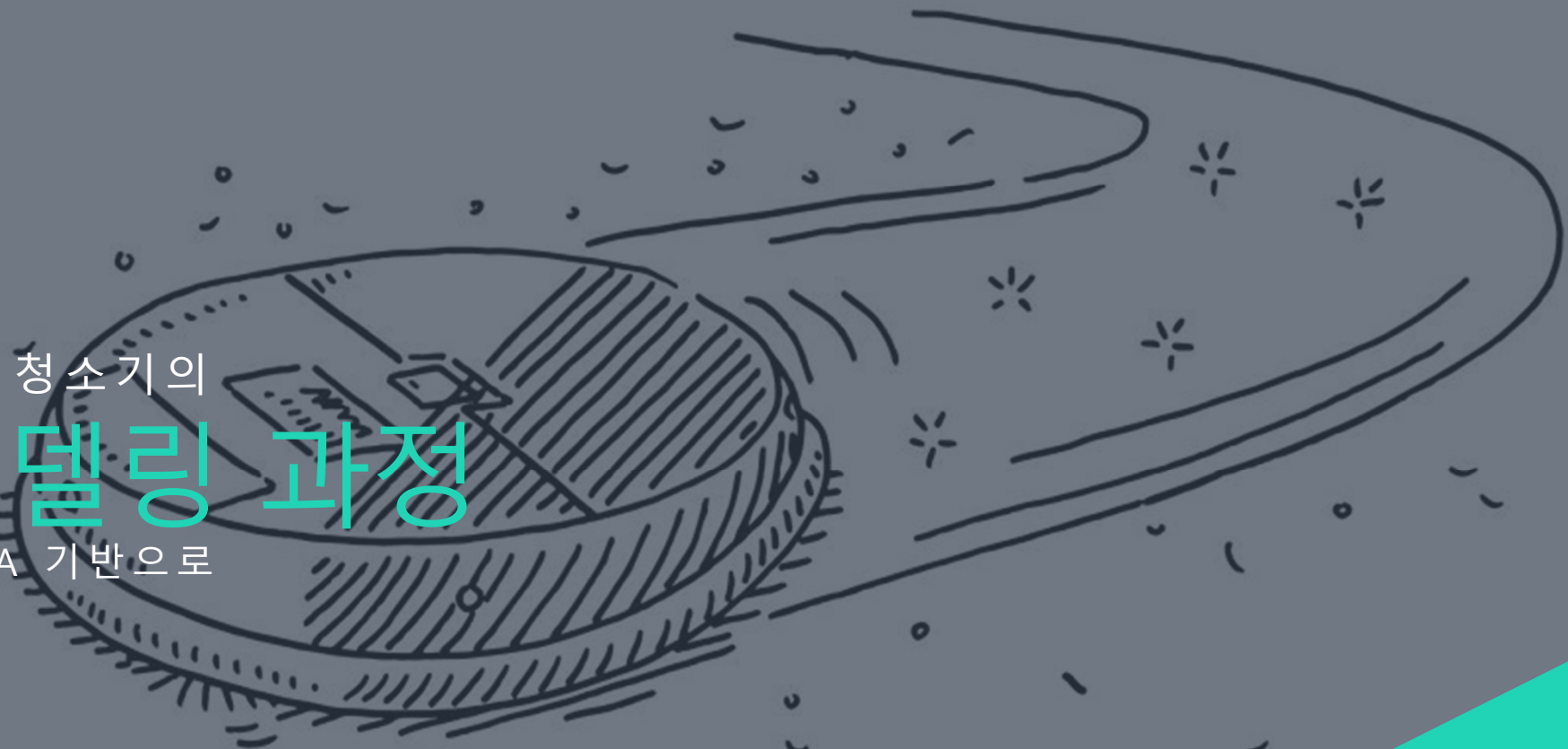
해결 방안



로봇 청소기의

모델링 과정

CATIA 기반으로



03



1. Station

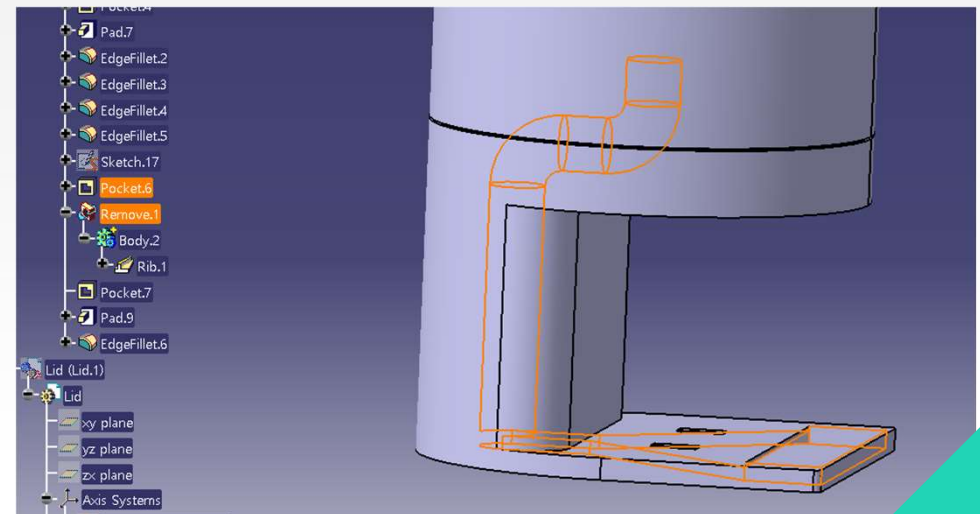
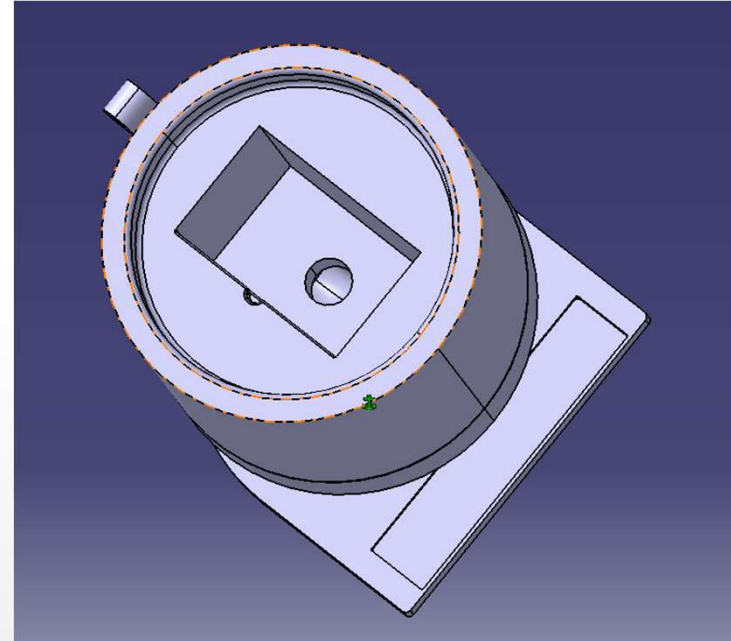
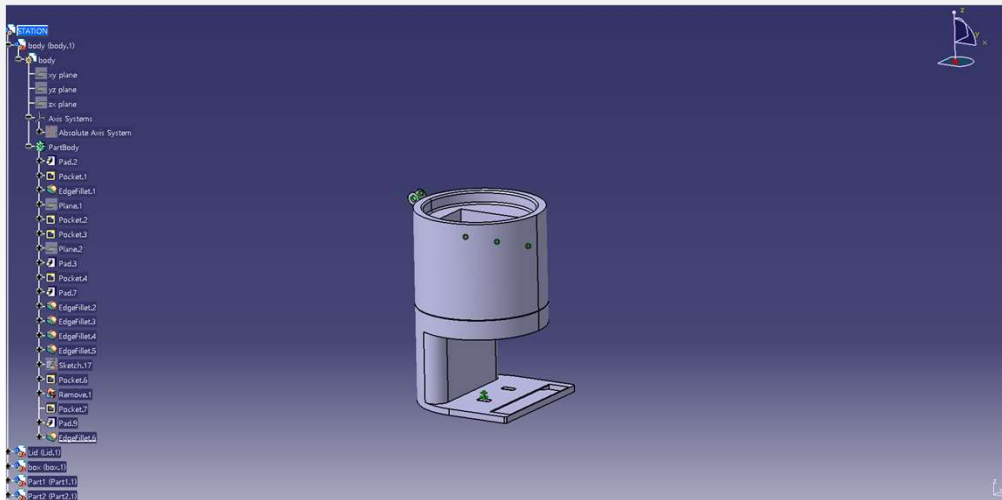


03



1. Station

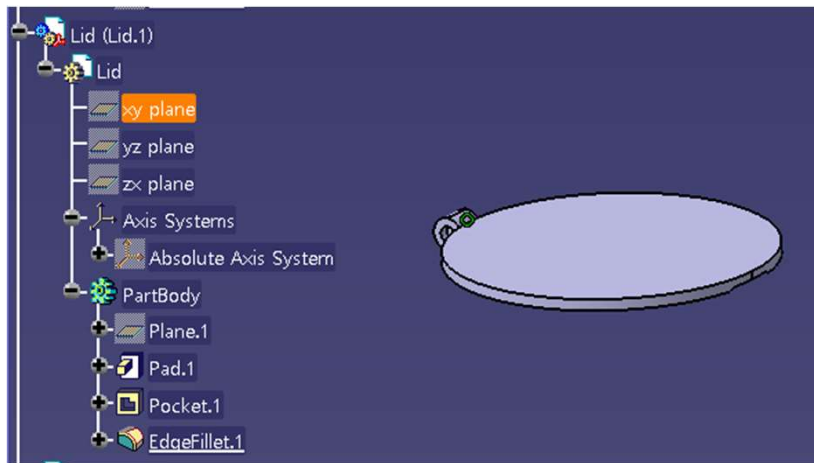
Body



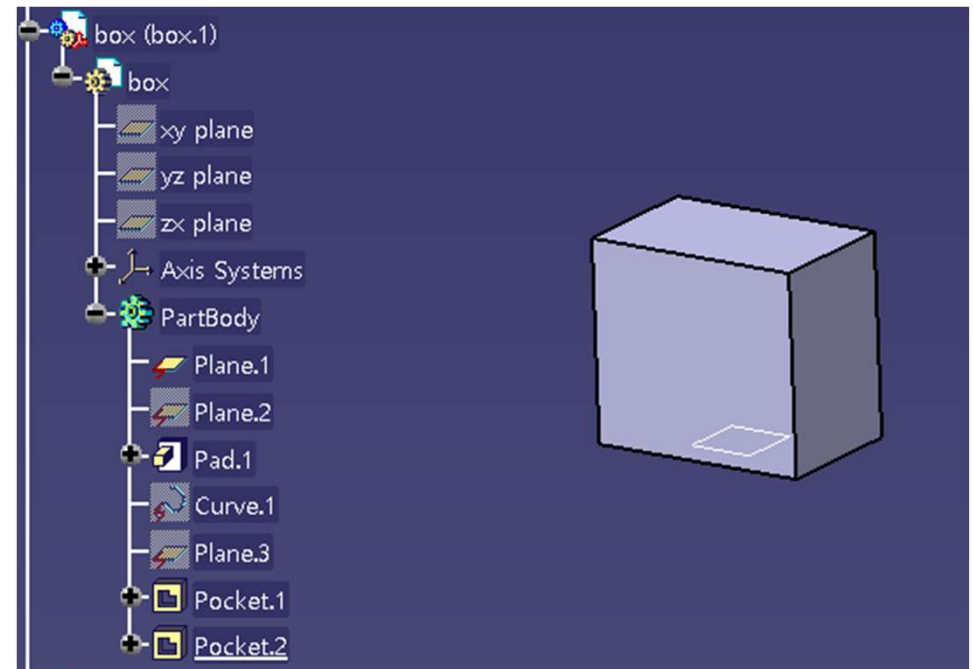
03



1. Station



Lid



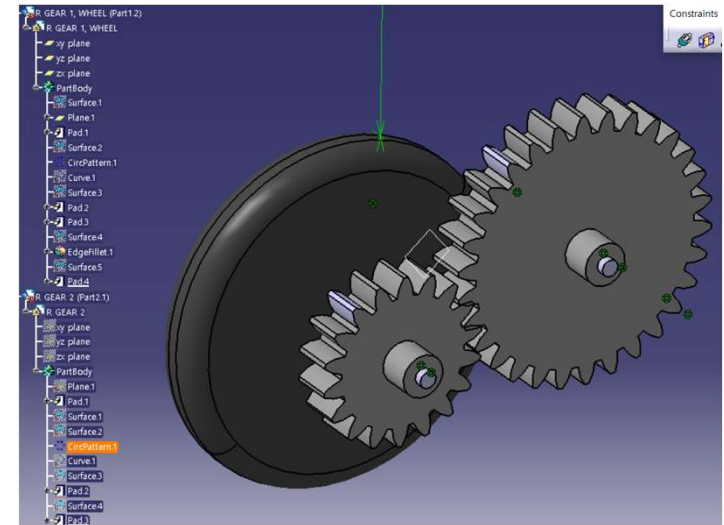
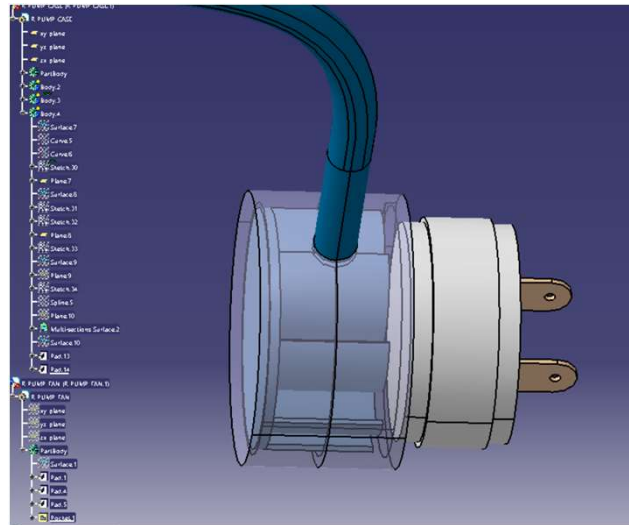
Box

03



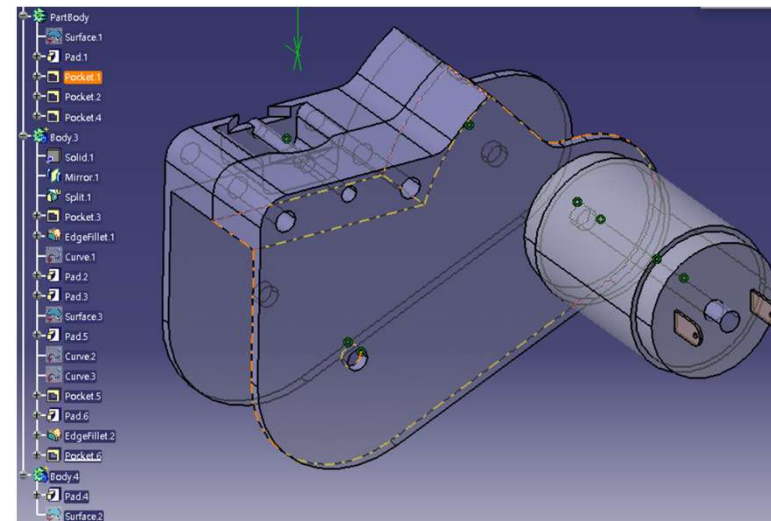
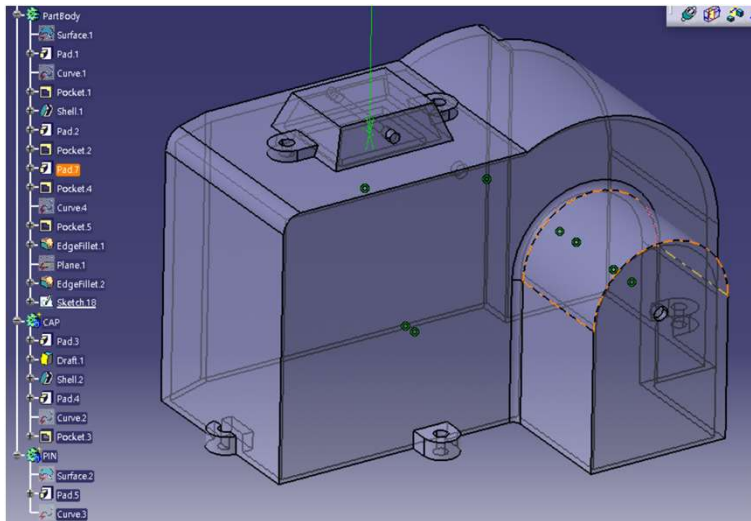
2. MECH

R Air pump
Assembly



R Gear
1,2 and
Wheel

R case



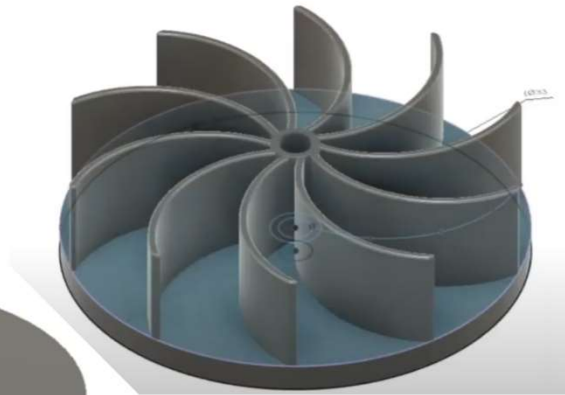
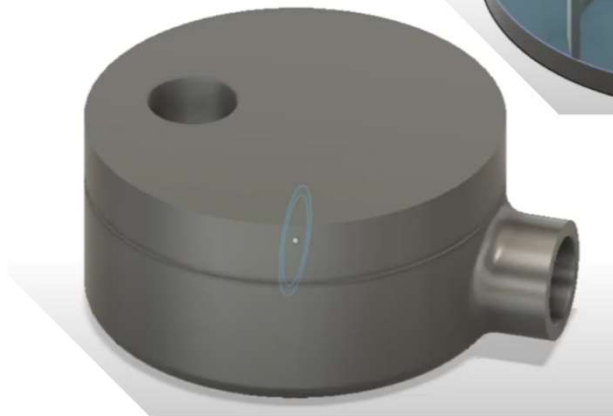
R
bracket,
motor

03



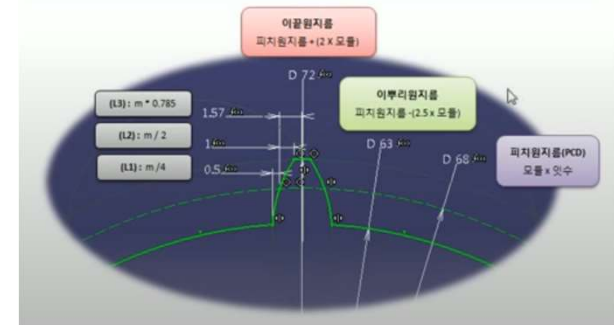
2. MECH

Air pump
참고 모델



Gear 1,2
제작 방법

모듈 (M) Module	피치원 지름(d) / 잇수(Z)
피치원 지름 (d) PCD- Pitch Circle Diameter	$M(\text{모듈}) \times Z(\text{잇수})$
지름피치 (P) Circular Pitch	$25.4 \times \text{잇수}(16) / \text{피치원 지름}(d) \star 25.4 \text{는 inch}$
원주피치 (t) Circular pitch	$\text{원주의 길이}(\pi \times \text{피치원 지름}(d)) / \text{잇수}(Z)$
잇수 (Z) Number of Teeth	$\text{피치원 지름(PCD)} / M(\text{모듈})$
전체이높이 Whole Depth	$2.25 \times M(\text{모듈})$
이끌 원지름 Addendum Circle	$\text{PCD} + (2 \times M)$
이뿌리 원지름 Dedendum Circle	$\text{PCD} - (2.5 \times M)$
1과 2 수직선의 간격 (L1)	$M(\text{모듈}) / 4$
2와 3 수직선의 간격 (L2)	$M(\text{모듈}) / 2$
2와 4 수직선의 간격 (L3)	$M(\text{모듈}) \times 0.785 (\pi / 4)$

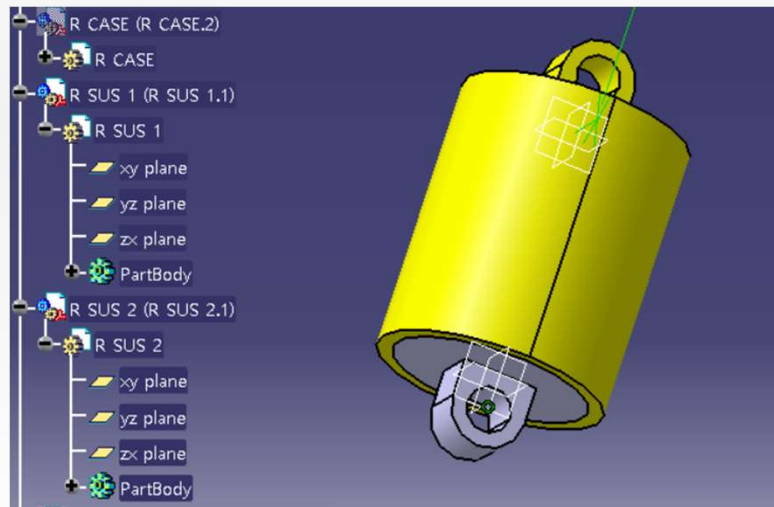


03

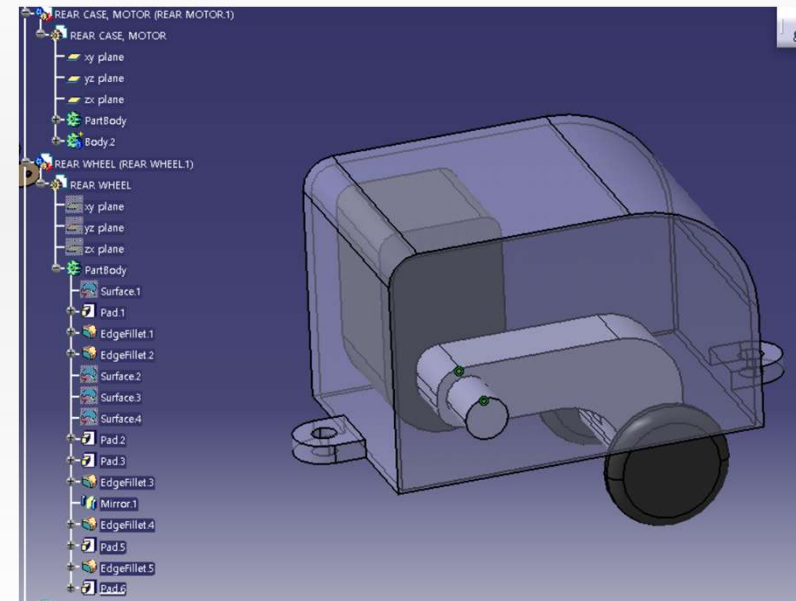


2. MECH

R Shock Assembly



REAR Wheel Assembly



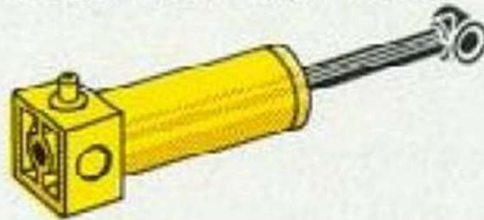
03



2. MECH



5104
Pneumatic Cylinder, 48 mm
Verrin pneumatique, 48 mm
Pneumatic werkcylander 4,8 cm
£ 1.60
FF 17.00
fl. 5,75



LEGO 5104
Pneumatic cylinder, 48mm

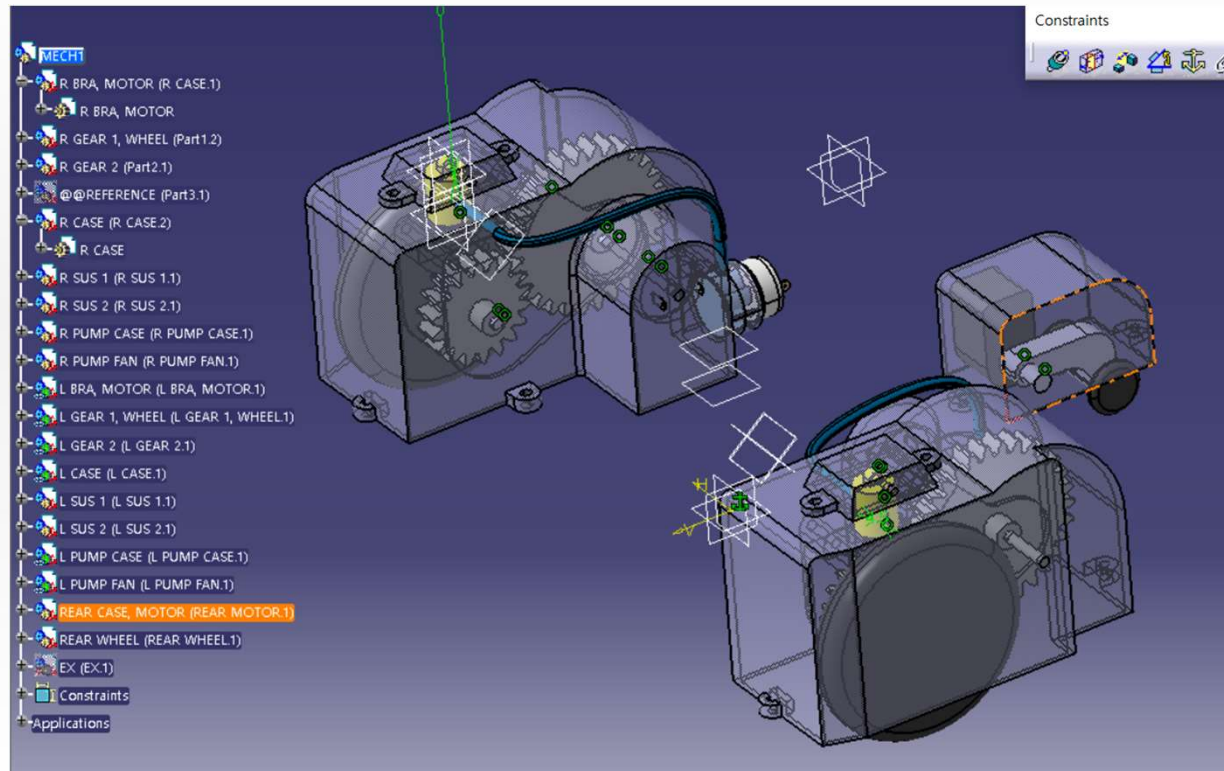
High torque servo
20 kg.cm at 7.4V, about 65g



03



2. MECH



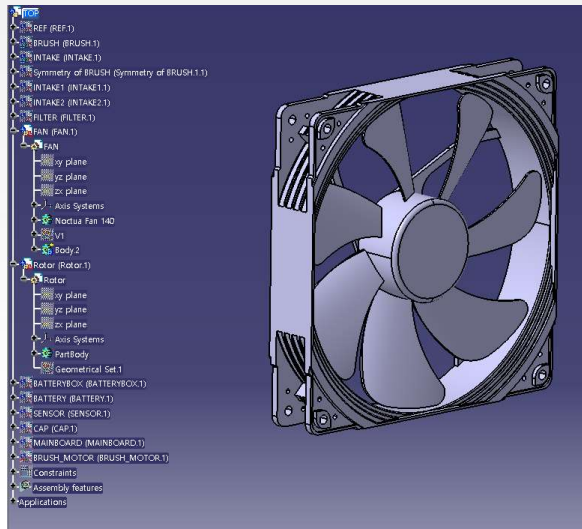
Wheel
Parts
Assembly

03

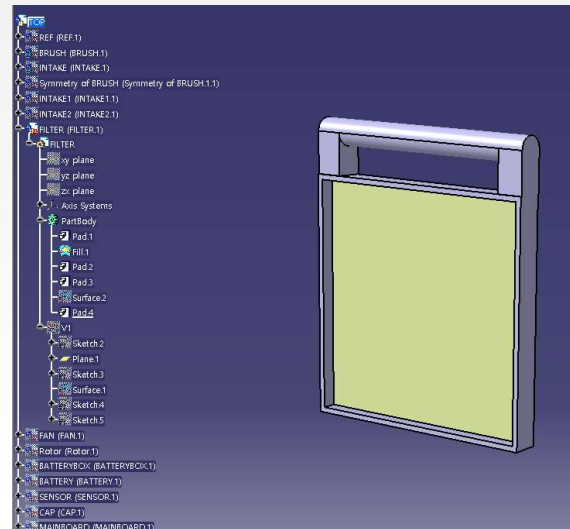


3. TOP (1) Air Intake

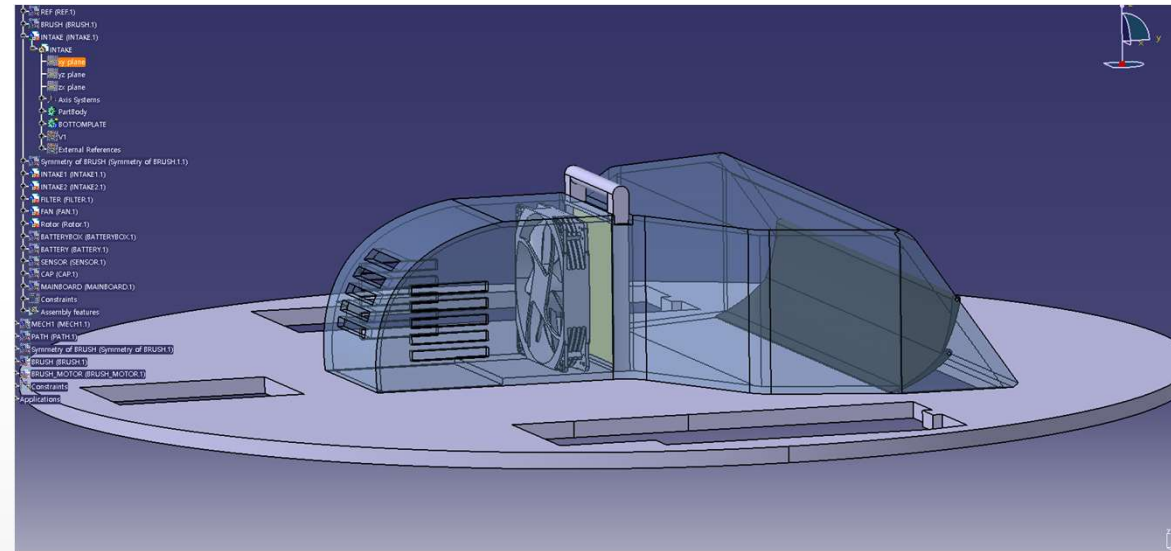
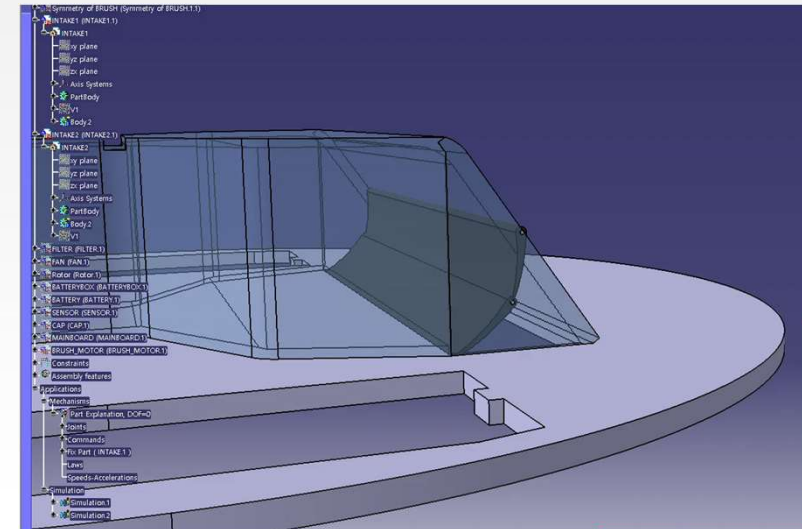
Motor Assembly
: Noctua Fan 140 design outsourcing



Dust Filter with Handle



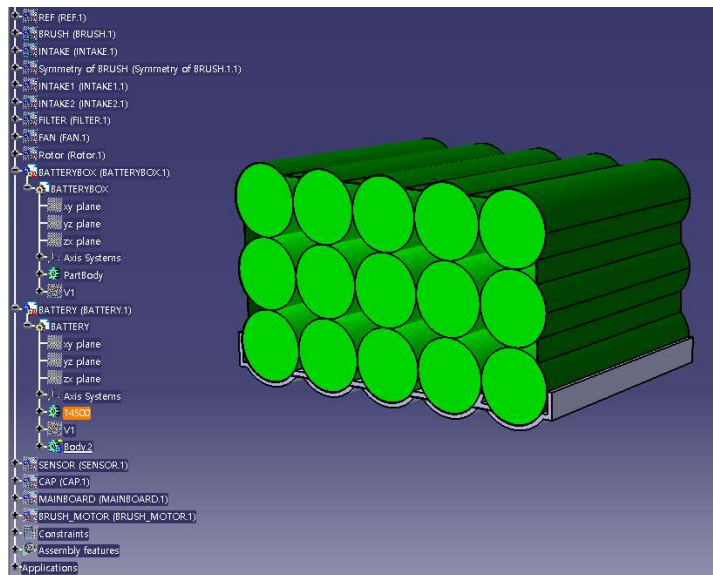
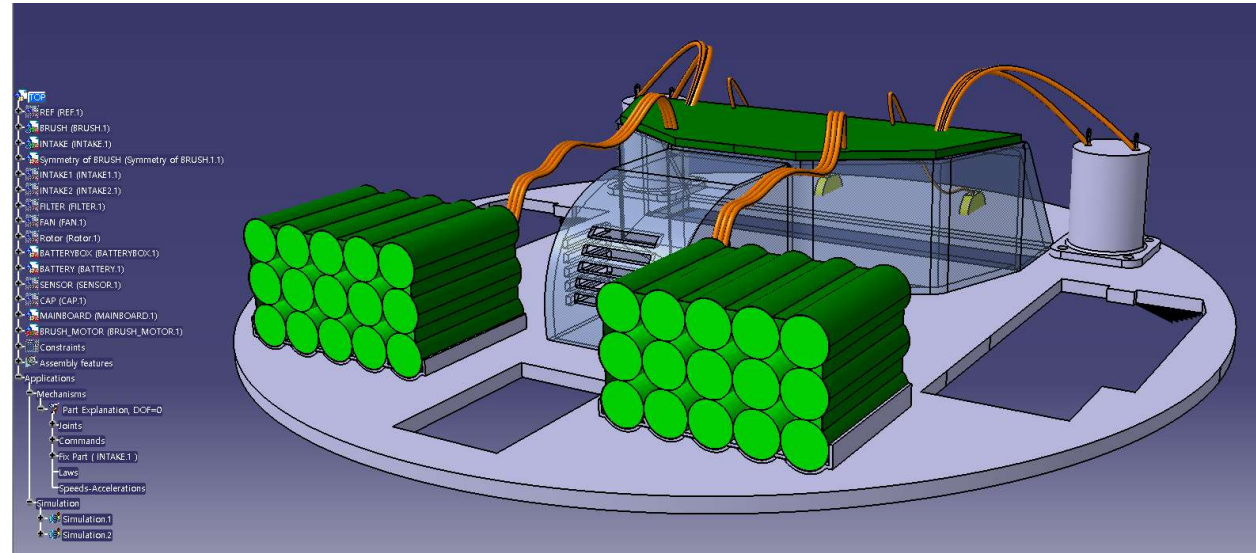
Dust Intake



03



3. TOP (2) Battery



Battery Spec:

- 5S3P (14500 1200mAh *5*3)
- 3600mAh
- 18.5V
- BMS included
- One battery Pack for each side

(Data:

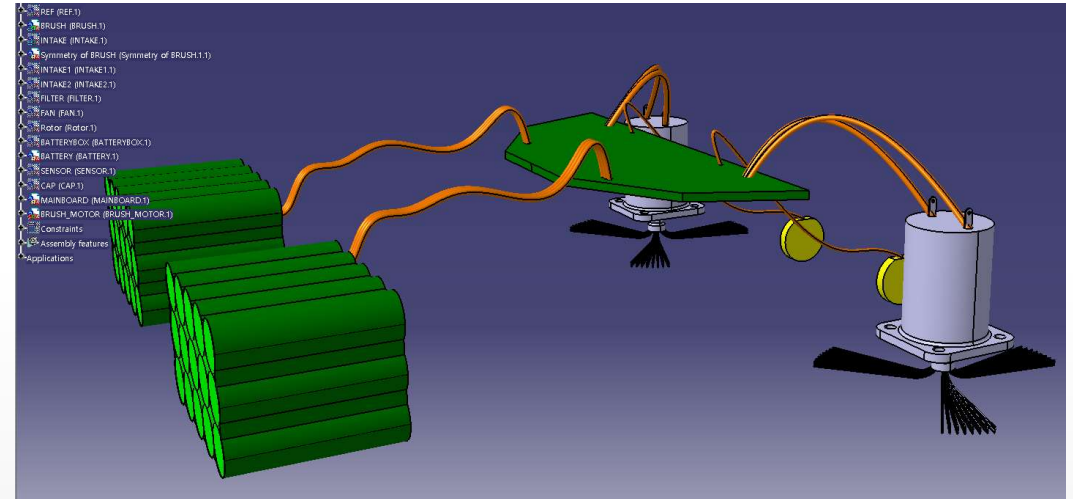
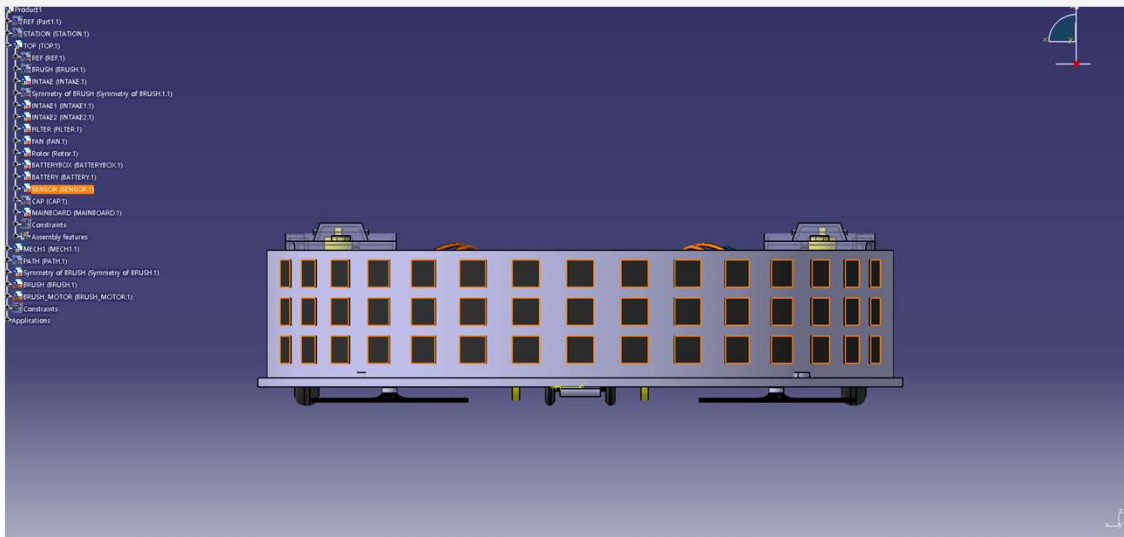
- LG A9: 2400mAh, 29.4V
- 삼성 NaviBot: 4000mAh, 14.4V
- 샤오미: 5200mAh, 14.4V)

03

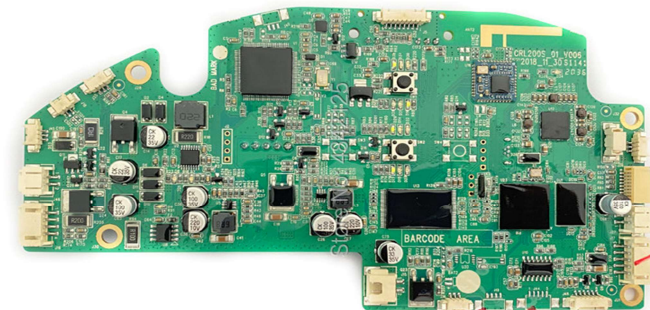


3. TOP (3) Mainboard & Sensor

Sensor Assembly



Mainboard Assembly

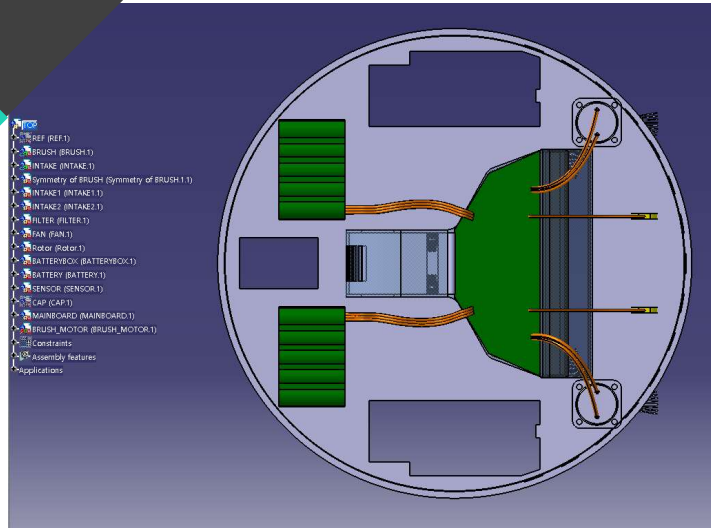


Xiaomi Mijia Mop P Main Board

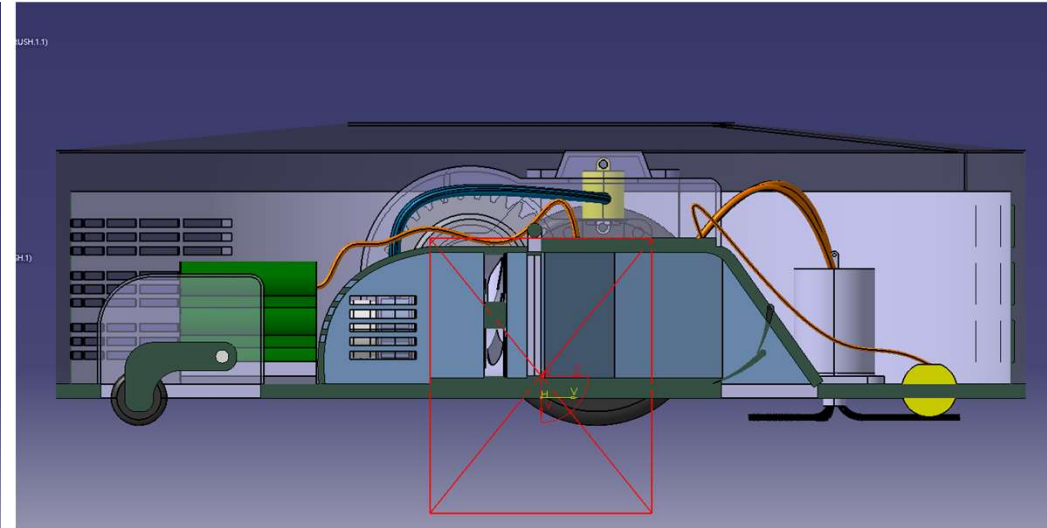
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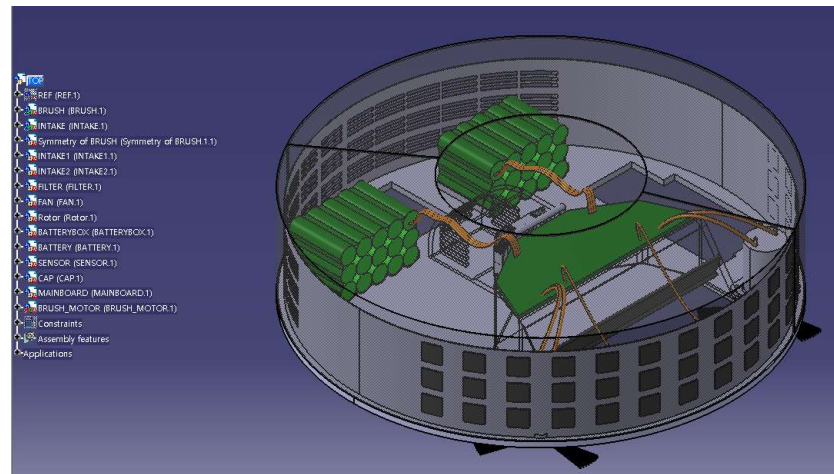
3. TOP



Top view



Section view : yz plane

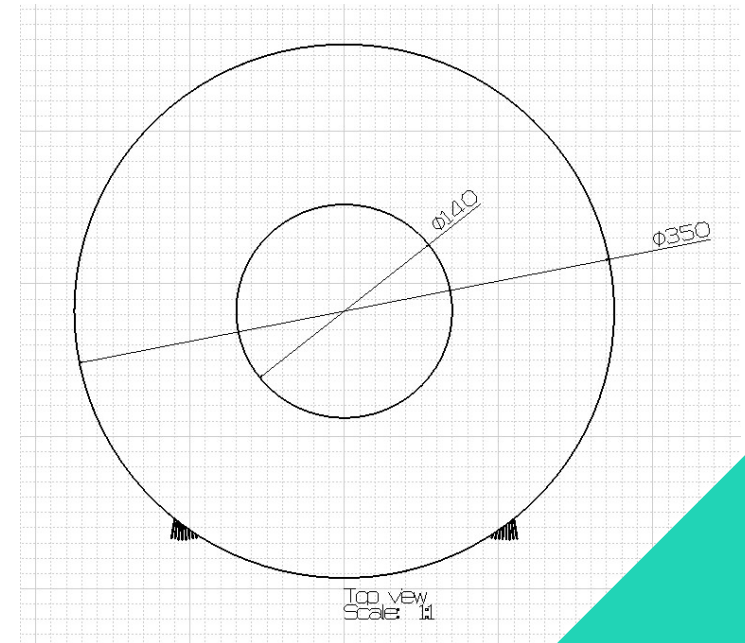
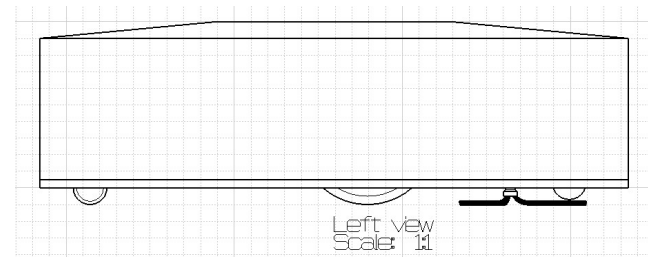
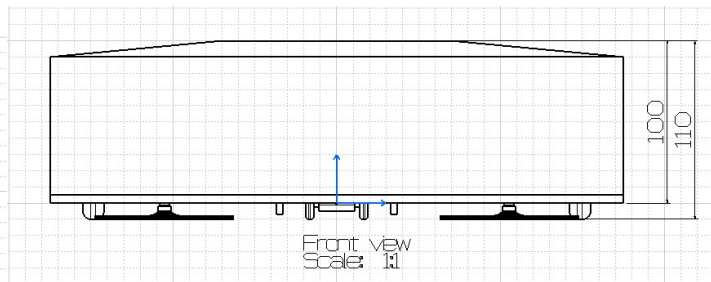
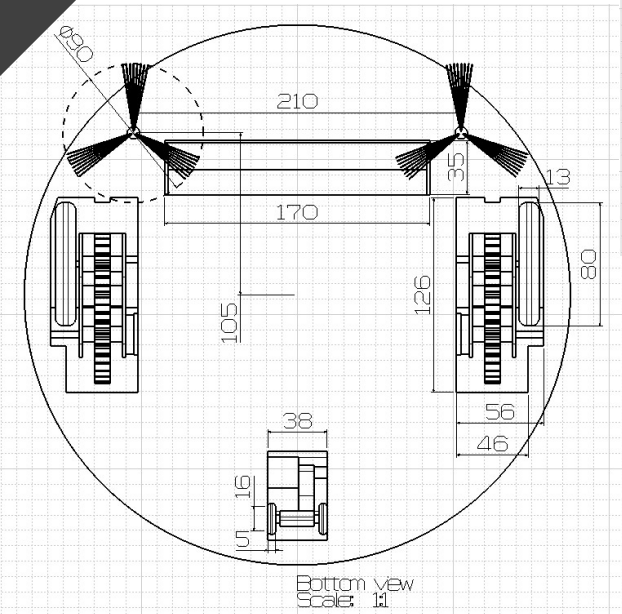
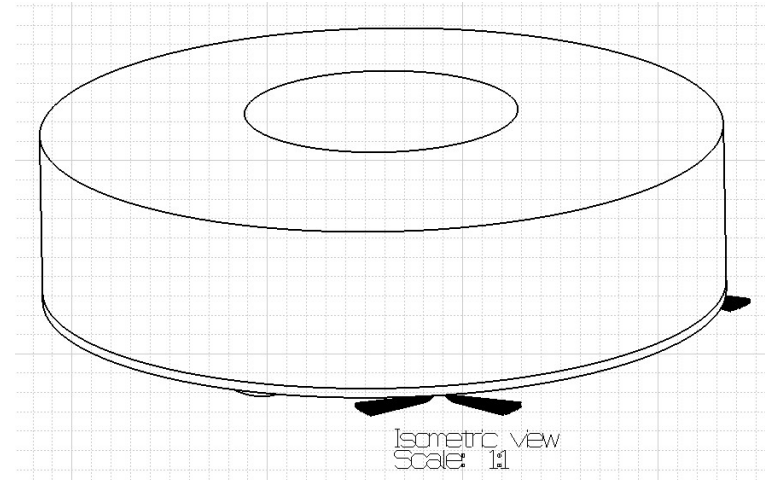


Isometric
view

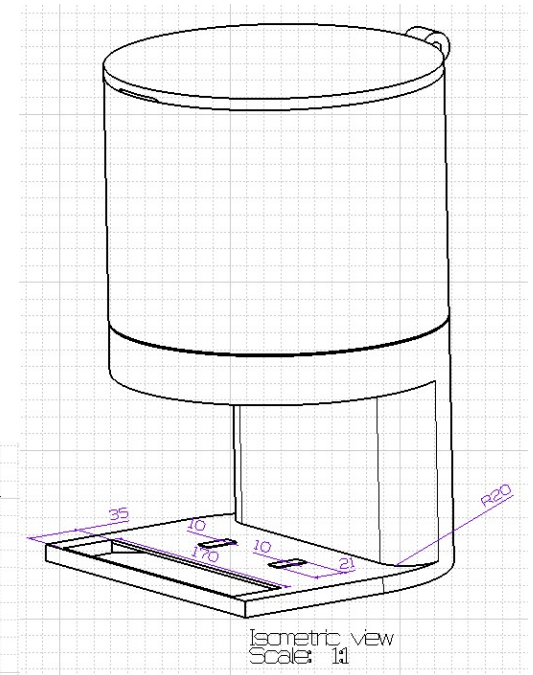
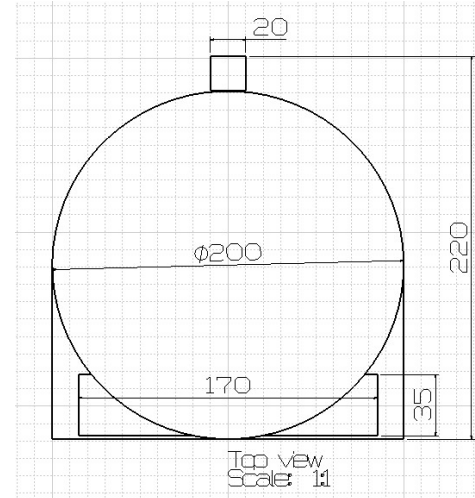
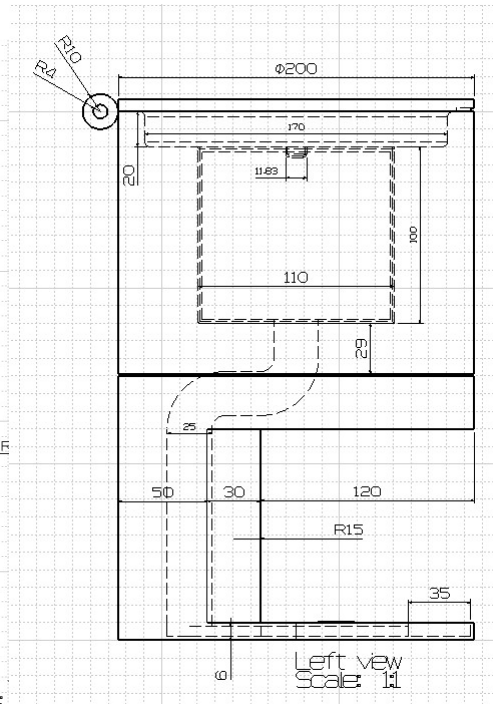
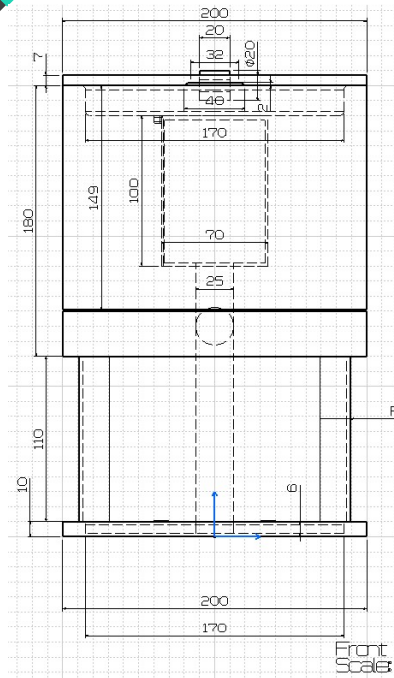
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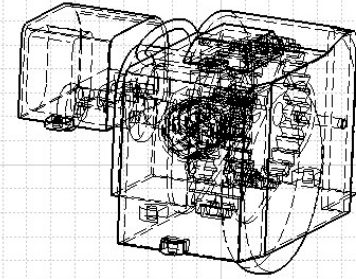


Draft : 꼬물이

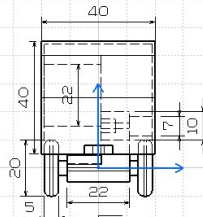
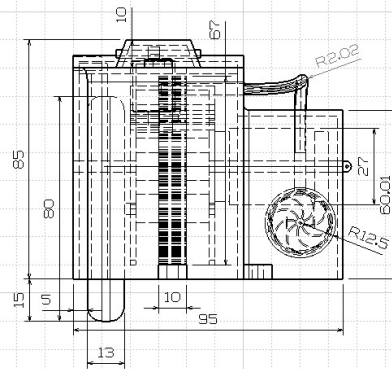


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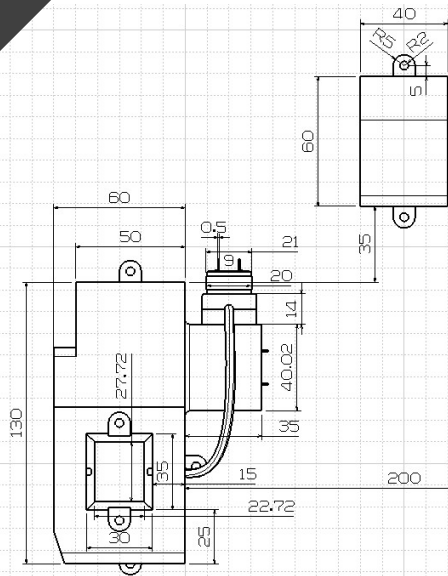
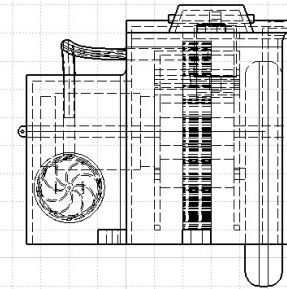




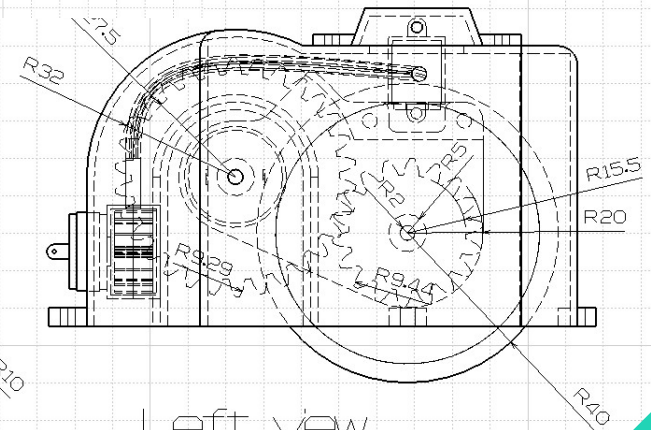
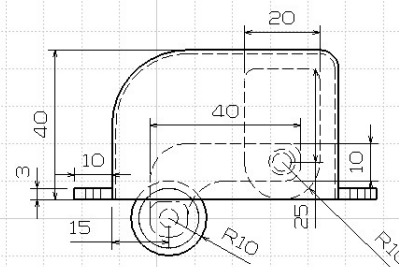
Isometric view
Scale: 1:1



Front view
Scale: 1:1



Top view
Scale: 1:1

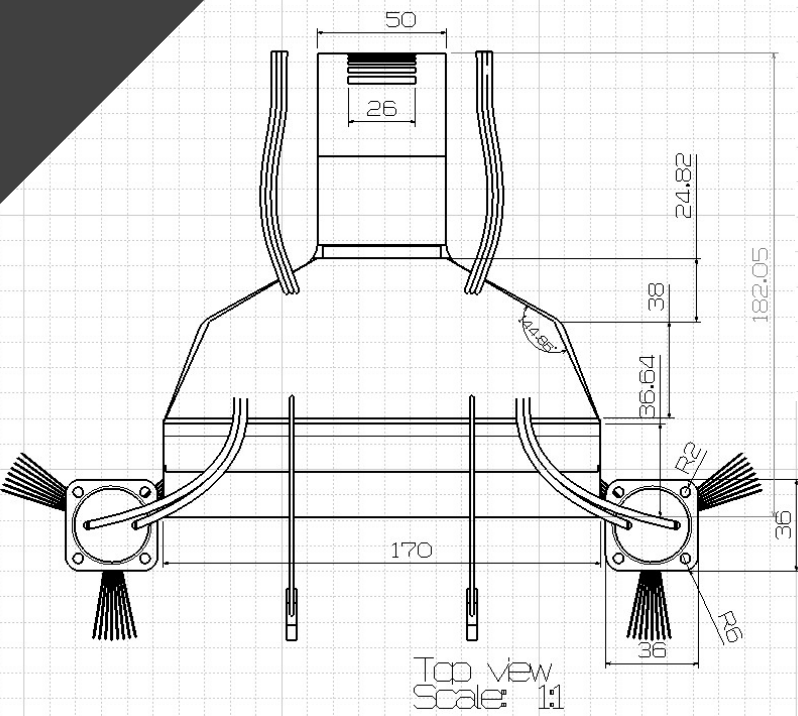
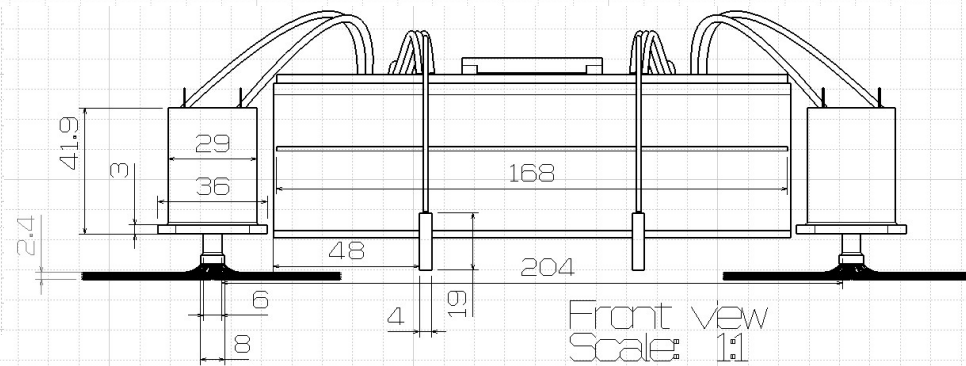
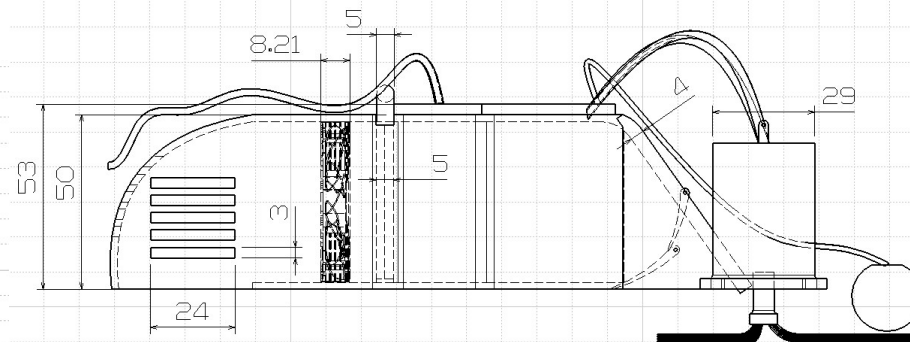
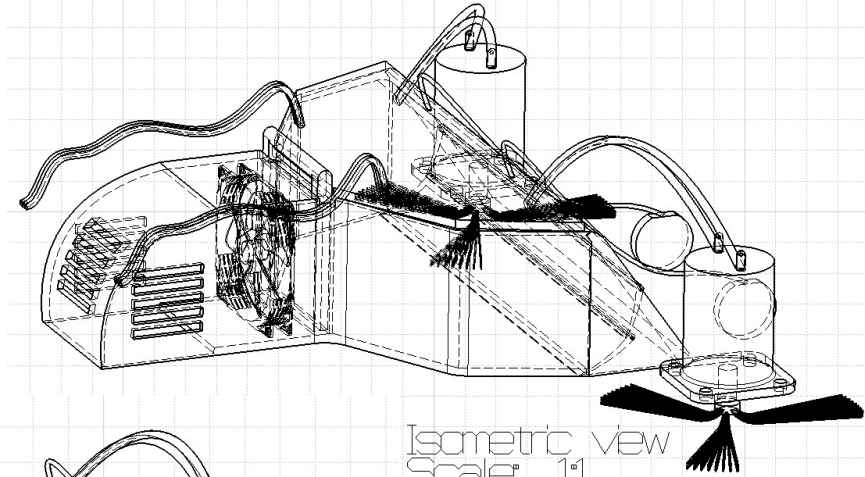


Left view
Scale: 1:1

03



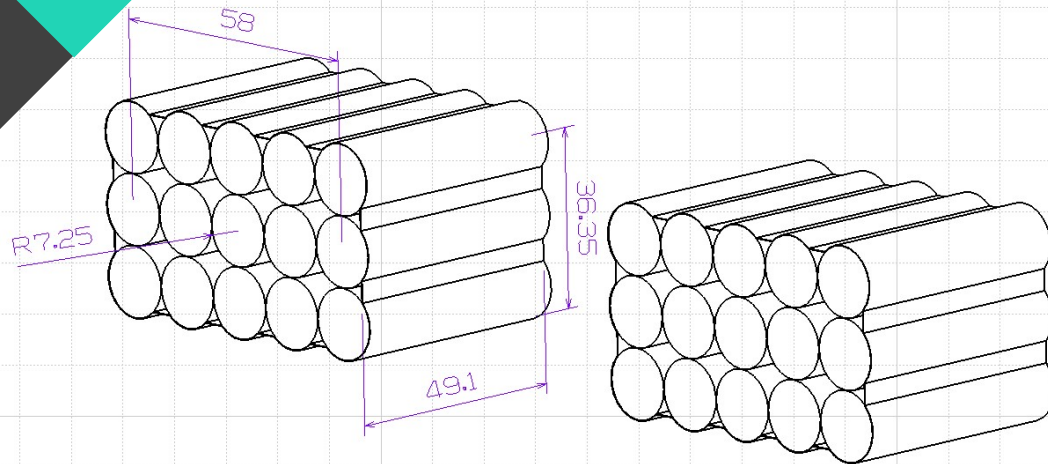
Draft : TOP



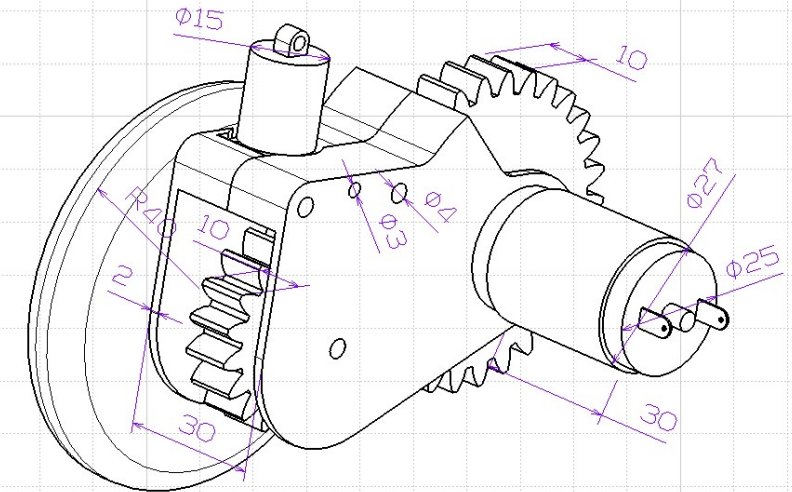
03



Draft : Battery & Gear



Battery Package
: 14500 Li-ion
Battery*15 *2package



Gear Box
: Gear Ratio 3:5

CATIA 로봇 청소기의

키네마틱 영상



05



동영상 링크

https://youtu.be/_Ox6kvUUyIQ



참고문헌

모델링 시 참고 정보 출처



참고문헌

-대한민국 특허청
“출원번호 10-2003-0043244 로봇청소기의 구동장치” (별첨)

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[-https://zdnet.co.kr/view/?no=20210430112342](https://zdnet.co.kr/view/?no=20210430112342)

[-https://www.etnews.com/20210419000176](https://www.etnews.com/20210419000176)



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to our presentation*