

About

Mu Lab, LTD. is the first startup company certified by Fukushima University.
We have successfully commercialized and sold the university's technology seed Crown Reducer, and electric grippers that combine another technology seed the Three-dimensional Cam Mechanism.

Mu Lab 2030 Vision

By implementing our innovative technologies—the Crown Reduction Mechanism and Three-dimensional Cam Mechanism—into society, we aim to contribute to solving social issues through our business.

—In 2030, Mu Lab will reach the moon—

Our Crown Roboxgear and Three-dimensional Cam Mechanisms are innovative solutions that satisfy the needs of companies aiming to realize a future robotic society. Looking further ahead, we believe we can contribute to humanity's challenge of exploring space, the final frontier. We dream that our technology, serving as small core components supporting the space industry, will journey together into the distant universe.

Business Overview

- Manufacturing and sales of components, actuators, and systems for power transmission devices
- Manufacturing and sales of precision machinery, machine tools, measurement and control equipment, and computers
- Development, design, inspection, measurement, and consulting related to the above machinery

History

- | | |
|------|--|
| 2012 | Began preparation to establish a startup company from Fukushima University under the Ministry of Education, Culture, Sports, Science and Technology's University- Initiated New Industry Creation Project (START) program. Developed a motor- integrated, millimeter-size, backlash-less joint actuator. |
| 2015 | Established Mu Lab Co., Ltd. |
| 2019 | Selected for the Ministry of Economy, Trade and Industry's J-Startup program supporting the development of start-up companies. |
| 2019 | Launched the Three-dimensional Cam Mechanism and Crown Reducer in collaboration with partner companies. |
| 2021 | Launched the company's own reducer and electric gripper products. |
| 2024 | Launched our own brand "Crown Roboxgear" |

Corporate Outline

Name: Mu Lab Co., Ltd.
Establishment: April 1, 2015
Location: 1 Kanayagawa, Fukushima City, Fukushima Prefecture 960-1296, Japan
Representative: President Masahide Fushimi

AMAZING INNOVATIONS FOR THE FUTURE

Mu Lab, LTD.



Millimeter-sized precision transmission mechanisms are essential for next-generation robots. Our core technology in the field is the Crown Reduction Mechanism—a simple gear configuration consisting of three rigid gears: the rotor gear, stator gear, and output gear. By utilizing these three crowns, we offer the next-generation compact precision reducer, Crown Roboxgear, as a core component, along with Three-dimensional Cams and compact electric grippers to support a robotic society.

The “robustness” required for precision compact reducers in the era of small robots means powerful torque, high rigidity for shock resistance, and longevity to operate continuously in high-load environments.

Robustness

High Torque

Increased rated torque for the reducer to maximize small motor power (double the torque for the same size)

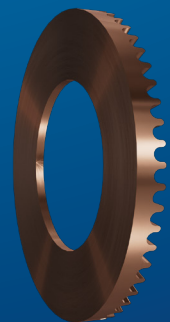
Shock Resistance

Instantaneous Maximum Torque: **45** Nm (for the 30-mm external dimension type)

Longevity

High Load Resistance

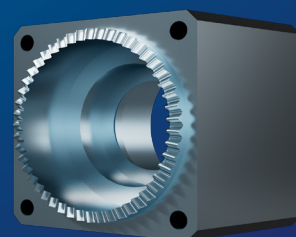
Rated Torque: **3** Nm (for the 30-mm external dimension type)



Rotor gear



Output gear



Stator gear

Operating Mechanism

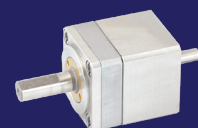
- 1 The outer side of the rotor gear contacts the stator gear whereas the inner side of the rotor gear contacts the output gear.
- 2 The motor's rotational movement is transmitted through the press rotor and converted into the rotor gear's precessional motion.
- 3 The precessional movement of the rotor gear, engaging with the stator gear with a different tooth count, causes deceleration, which is then transferred to the output gear to perform the reduction operation.



Watch the video on the operating mechanism here!

Crown Roboxgear Lineup

Solid Type



The basic unit, offering greater rigidity than the hollow type, is more cost-effective and can be connected to various motors.

Hollow Type



The rotating shaft is tubular, allowing wiring to pass through the shaft or the hollow hole to be used for connecting other devices, achieving space-saving design.

Geared Motor Type



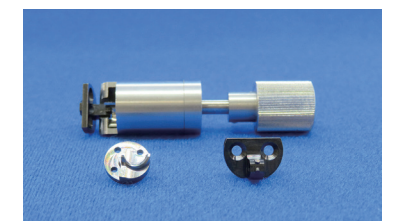
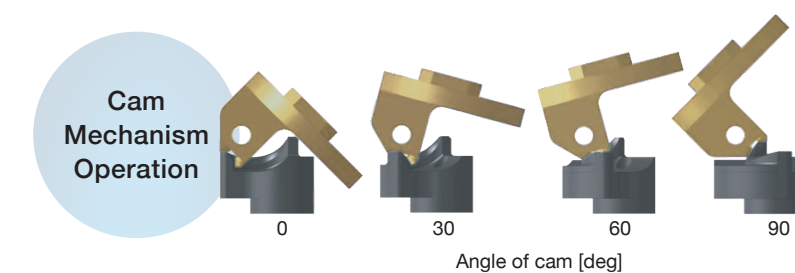
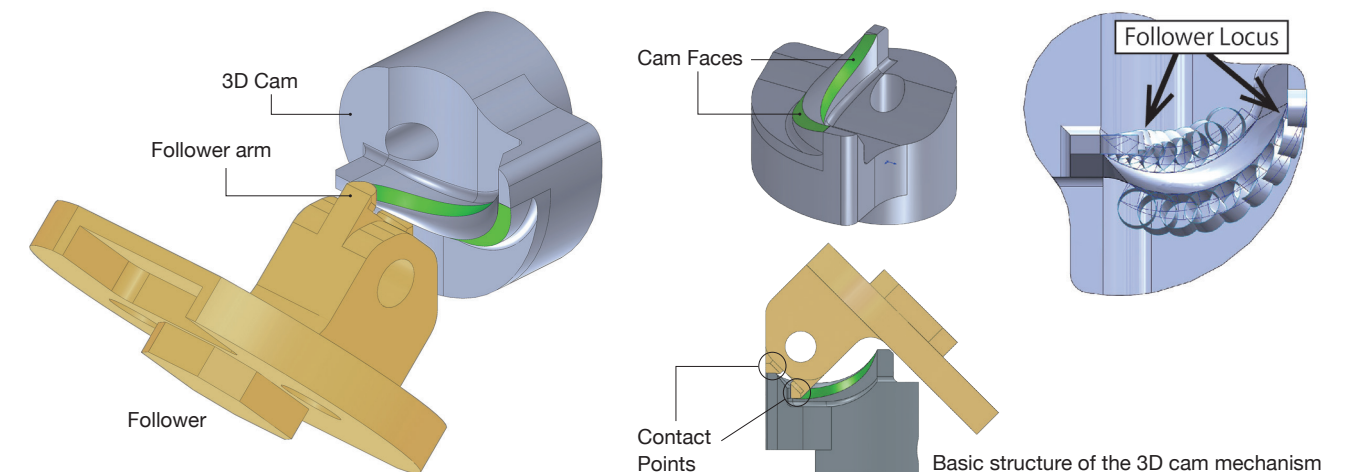
By integrating the motor and the reducer, space-saving and torque optimization are achieved for the entire unit.

Precise Nonparallel Shaft Transmission with Small Diameter

Three-dimensional Cam Mechanism

EP 2163787 / US 8,418,572 / CA 2,688,597

- Features**
- Comprises a cam with two Three-dimensional Cam surfaces and a follower
 - Two sets of cam surfaces and followers are always in contact



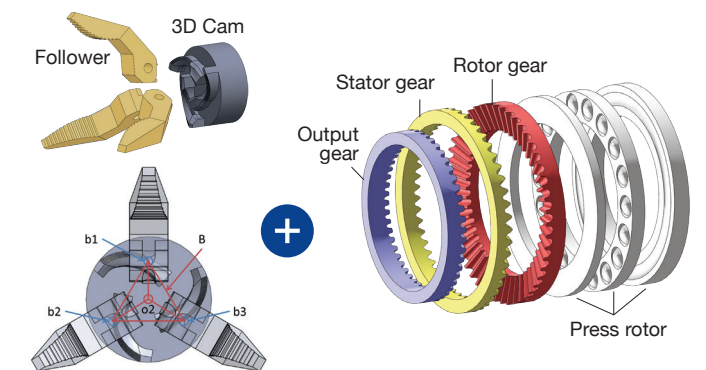
Prototype with $\phi 12$ [mm] diameter

A compact, lightweight, high-output electric gripper capable of ultra-precise movements.



μ Dynamics Gripper RBCK30 Series | External dimensions: 30 mm

- Features**
- With a powerful gripping force of 20 N and precision handling of $\phi 0.5$ mm
 - Gripping Without Position Command



By applying the Three-dimensional Cam Mechanism, precise three-jaw gripping is achieved.

Utilizes the Crown Reducer's compact, lightweight, and high-output characteristics.