(SD2022-401) Dynamic Counterbalance to Enable Chronic Free-behaving Research with Small Animals

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ABSTRACT

Researchers from UC San Diego have created a system to enable animal model research by reducing the physical impact of weight introduced by body worn or implanted instrumentation. It does so by dynamically counterbalancing the force introduced by the additional mass of the instrumentation.

Together the dynamic counterbalance system, dynamic adjustment arm, and dynamic pulley provide a low cost system that addresses several of the pressing weight constraints of chronic small animal experiments. Together they will enable researchers to conduct experiments that would not have been possible due to weight restrictions of existing recording instruments.

DESCRIPTION

At present the weight of recording instruments used in small animal research is addressed by using a simple counterweight system. While great in theory this approach both doubles the inertia on the animal making it harder for them to move and creates a force that can stress the subject. Thus introducing behavioral confounds into the data being collected.

APPLICATIONS

Enabling biomedical research with small animals and advanced instrumentation.

ADVANTAGES

The system also includes an adjustment arm that allows counterbalance to function effectively as the animal to move around in a three dimensional space.

The dynamic counterbalance system not only reduces the inertia of instrumented subjects but also reduces the forces experienced by the animals. This design will likely reduce the stress on the animals used in research and will increase the total weight of instruments that can be used safely in these types of research paradigms.

OTHER INFORMATION

KEYWORDS

passive counterbalance, dynamic counterbalance, electrophysiology, neurophysiology, tethering

CATEGORIZED AS

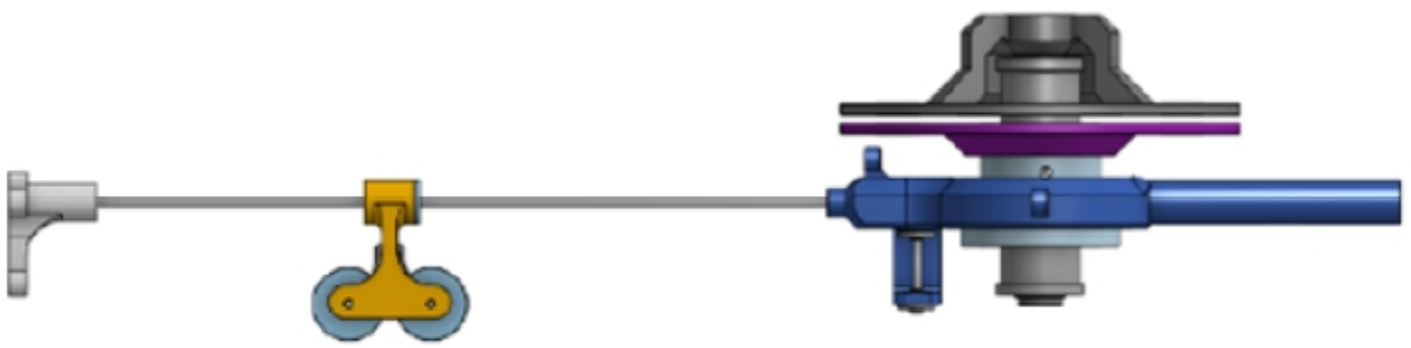
- **Agriculture & Animal Science**
  - Devices
- **Medical**
  - Research Tools

RELATED CASES

2021-Z08-1

This will not only improve data acquisition of existing experiment paradigms by removing the stress due to instrument weight, but also enable novel experimental protocols that were not feasible due to current weight constraints.

STATE OF DEVELOPMENT



INTELLECTUAL PROPERTY INFO

UC San Diego has filed patent applications on this invention and is seeking companies interested in commercially developing this.

RELATED MATERIALS

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