Argonne NATIONAL LABORATORY

Available for Licensing

Containment Unidirectional Resource Loading System (CURLS)

Bringing flexibility and assurance to containment systems

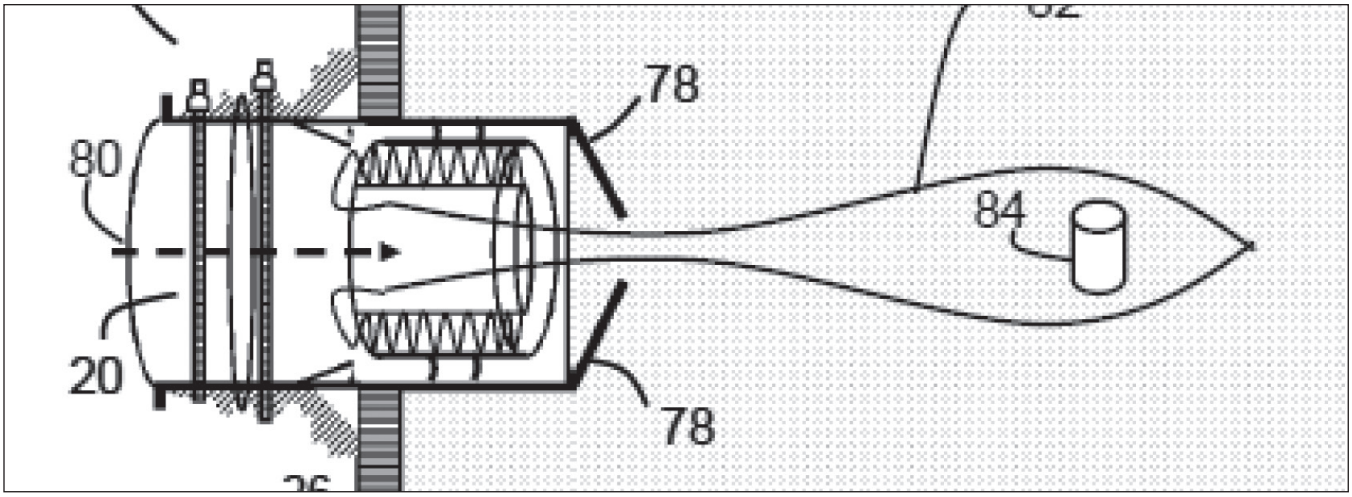
The Invention

Gloveboxes are used in research, product development, process development, scale-up, testing and production labs across the world. They allow safe handling of materials such as nano powders, noxious chemicals, flammable vapors, radioactive materials, DNA/RNA snippets, battery materials and more. Gloveboxes are used to guarantee worker safety, experimental integrity and assure that testing batches are not contaminated. However, most gloveboxes today are task-specific and can only be used for one kind of scientific protocol; in addition, often material must be transported in or out of the glovebox without loss of containment. To meet these challenges, Argonne invented CURLS for gloveboxes, with the flexibility to apply to any containment system.

CURLS is a "tunnel" that installs in an existing glove port along with various co-designed resource cartridges that allow easy and rapid change-over of resources without losing containment. With CURLS, when a different resource is required, the user merely inserts the specific resource cartridge into the CURLS tunnel until it engages, causing the used resource cartridge to drop into the glovebox — all while maintaining complete containment.

The novel CURLS continuous sleeve ring revolutionizes material transfer in and out of gloveboxes. All CURLS resource cartridges are designed to break into several pieces so that used cartridges can be easily removed from the glovebox via "bag-out" so that used cartridges do not clutter the work space.

CURLS prototype tunnel port and cartridge



Schematic of CURLS "bag in" (taken from patent application)

Benefits

- No breach of containment or batch contamination
- Quick change-over of resources
- Allows gloveboxes to be "multi-tasking" and reconfigured "on the fly"
- Fewer lost experiments and production batches
- Simplifies containment procedures

Applications and Industries

- Nuclear industry
- Material science, chemistry and physics laboratories
- Pharmaceutical industry
- Biotech industry
- Semiconductor and battery industries
- Any industry where containment systems are used

Developmental Stage

Prototyping – demonstration unit already used to process 38 drums of plutonium powder-laced materials

Availability/Commercial Readiness

Available for commercialization

Argonne Invention Number

ANL-IN-12-052

Intellectual Property

Patent pending

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