



Science and Technology

EMERGENCY PREVENTION & RESPONSE

MAGNETIC BREAKAWAY MOUNT FOR TOOLS AND EQUIPMENT

THE MAGNETIC BREAKAWAY MOUNT PROVIDES READY ACCESS TO TOOLS WHILE INCREASING SAFETY IF TOOLS CAUGHT ON ENVIRONMENTAL HAZARDS.

Personnel in many fields (first responders, military personnel, divers, motorcyclists, scuba divers, etc.) carry various pieces of tactical gear or equipment fastened to their persons for easy access. These can become a hazard if caught on something. Use of a breakaway mount will minimize this safety hazard and has the added benefit of keeping tools easily accessible and controls release, minimizing accidentally dislodging.

The breakaway mount has a baseplate that is magnetically connected to an equipment holder. The magnet strength is tuned to fail above a certain load but will not detach prematurely. The mount self-oriens such that the equipment reattaches the same way each time and allows reseating equipment easily.

The base plate is fastened to the person's clothing by Velcro or something similar and contains magnets that face away from the individual. The equipment holder is designed to hold various tools. The tool is fastened to the equipment holder using Velcro straps or similar. The equipment holder also contains magnets that hold it in a specific orientation to the base plate. For safety, the magnet strength is tuned so that the magnets will separate under load before any of the fasteners.

The prototype breakaway mount was designed to hold flashlights on helmets for US Coast Guard divers, but the concept can be used in many situations.

KEY BENEFITS

- + Increases overall worker safety
- + Decreases the chance of snag and/or catch hazards
- + Increases accessibility of key equipment
- + Equipment holder can accommodate a variety of tools

STAGE OF DEVELOPMENT

Prototype

PARTNERSHIP SOUGHT

License

Cooperative Research and Development Agreement (CRADA)

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DHS COMPONENT

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The Technology Transfer and Commercialization Branch (T2C) within the Office of Industry Partnerships (OIP) of the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) serves as the centralized point to manage technology transfer activities throughout DHS and the DHS laboratory network. T2C@hq.dhs.gov

THE TECHNOLOGY

This mount is made up of two parts, a baseplate with a guiding rail and a mating equipment holder. The baseplate is fastened to clothing or personal protective equipment (PPE) using Velcro straps or bolted in place. The tool holder is magnetically attached to the holder. The equipment holder is designed to hold various tools. The strength of the magnets within both parts is tuned so that the magnets will separate under load before any of the fasteners. The geometry of the railing is designed to allow strong magnetic attraction and orientation of the equipment holder to the baseplate. This design allows easy access to equipment that will breakaway if caught but stay in place during normal operating conditions.

The breakaway feature increases user safety if protruding equipment is caught on handrails, tree branches, fishing lines, and other hazards. In this case, the magnets will fail and the holder will break away from the baseplate. After breakaway, the holder remains attached via a backup severable lanyard for easy retrieval and reattachment. This lanyard can also be severed, and holder and equipment abandoned in an emergency.



Example of a piece of hardware in the form of a flashlight, which is connected to the hardware support and fastened with fastening straps.



Flashlight and camera mounted to right side and top, respectively, on helmet of US Coast Guard Helicopter Rescue Swimmer manakin. Each piece of hardware is connected with fastening straps to the hardware support, which is bolted to the helmet.

APPLICATIONS

The technology has several potential end-uses:

- + Tactical equipment mounts
- + Modular tool mounts
- + Bicycle/motorcycle helmet accessory mounts

PATENT INFORMATION

US Patent number 11,069,465



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