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Mechanical Non-lethal Weapons Technologies



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1 Counter-Personnel NLW Technologies

1.1 Mechanical NLW Technologies

1.1.1 Non-lethal Barriers and Entanglements

Barriers are used as non-lethal weapons devices for many years by armies, law enforcement and corrections, and for other physical security applications. Existing and potential non-lethal mission uses of barriers and entanglements are extensive. Barriers can be used to form a line of demarcation, to separate adversaries from friendly forces, to delay adversaries from gaining access to an area, to secure facilities, to stop vehicles, to disable boats, and to serve in many other applications where delaying an adversary's action is required. Barriers encompass a broad range of devices, materials, and systems, ranging from simple devices, such as caltrops, to complex barrier systems utilizing movable concertina blankets and portcullises. They can often be made more effective by combining technologies, for example, concertina used in combination with an obscurant as a barrier in an interior application.

Barriers may also include materials applications for the purpose of delaying adversaries. Well-known examples are sticky foams and rigid foams for rapidly blocking areas or gluing other barriers in place. Low-coefficient-of-friction materials can act as barriers against the transit of personnel or vehicles. High-expansion-ratio, high-strength materials are of particular utility for non-lethal use, because the transported volume of these materials is far less than the dispensed volume.

Many effective barriers utilize high-strength materials (e.g., steel) and mass (e.g., concrete or earth) to effect a needed delay. A challenge in applying barriers and entanglements to non-lethal uses is to develop effective barriers with weights and stored volumes acceptable for staging and deploying the barrier. Re-use is desirable in many applications to reduce deployment costs of barriers and to minimize storage volume.

Rapid deployment is often the major challenge for effective barrier use. For vehicle barriers or entanglements, rapidly deployable systems are necessary for putting barriers in place before a vehicle can enter a secure zone or for allowing timely interdiction of moving land vehicles or watercraft. Precision delivery of barriers may be required. An example is the running gear entanglement system (RGES), which has proven to be effective in temporarily stopping small, fast watercraft. A challenge with a RGES is to integrate the barrier with capable delivery systems providing rapid and accurate delivery. Several countries are developing helicopter-based deployment systems to accurately and safely emplace the RGES in order to stop fast boats. In some situations, remotely piloted watercraft would be the platform of choice in deploying RGES-like

barriers. Such watercraft might also serve as barriers themselves, in much the same way that police use squad cars to channel, block, and/or ram suspect vehicles.

Artillery has been used to deploy large capture nets in proof-of-concept demonstrations for the U.S. Army. Similar use of naval cannon, to deploy entangling rope arrays near approaching boats, both to warn and to entangle running gear should a boat cross the deployed barrier, might be envisioned.

1.1.2 Rapid Barriers

a) Principles and System Description

A passive means of crowd management could be achieved by the deployment of appropriate rapid barrier technology.

Control may be achieved via fast rising portable, telescopic cylinders between which nets or similar other constructions, airbags or plastic films could be suspended. The system could be fixed to protect permanent assets.

b) Advantages and Disadvantages

The barrier system is seen as an excellent means of deterring the passage or channeling of crowds, and light or soft-skinned vehicles and would be an appropriate means of rapidly erecting a manned barricade.

1.1.3 Nets & Entanglement Techniques

a) Principles and System Description

Both small groups and individuals may be trapped or denied access to areas or assets by the deployment of nets or other entanglement devices.

Micro wires are thin steel wires compacted under tension. When deployed, the wires expand to assume pre-determined geometric shapes formed from a tangle of the wire itself. Expansion ratios of 1:6000 are achievable. When deployed, the devices could be used to prevent access by personnel from designated areas. The devices could also be deployed to prevent egress of hostile groups from designated assets.

b) Advantages and Disadvantages

The barrier provided by micro wires has the capability of providing coverage of a very large area from a very small deployable volume. However there are certain restrictions that must be considered when this device is deployed against

persons rather than material objects. The concept is best-deployed in open and largely unoccupied areas.

More information can be found at:

[Non-Lethal Weapons \(NLW\): Industry, Technologies & Global Market - 2014-2020](#)