

F41H

ARMOUR; ARMoured TURRETS; ARMoured OR ARMED VEHICLES; MEANS OF ATTACK OR DEFENCE, e.g. CAMOUFLAGE, IN GENERAL

Definition statement

This place covers:

This subclass covers the defensive aspects such as protection gear camouflage and personal, vehicle and stationary armour (passive and active).

It includes armed and armoured vehicles.

It further includes offensive and defensive systems using flames, gas or smoke.

It also includes passive and active tactical defence installations, including laying or removing land mines and other obstacles.

It includes means of attack other than conventional weaponry, e.g. electrical stunning means, directed energy weapons, EMP generators.

F41H 1/00

Personal protection gear (shields for personal use [F41H 5/08](#); {footwear for use in minefields [A43B 3/0026](#)}; for protection against chemical warfare [A62B](#))

Definition statement

This place covers:

Protective gear worn by a person against ballistic aggression. It might also include protection against malevolent knife or needle aggression (professional cut/puncture resistant garments, see limiting reference).

Includes means for strapping said gear to the body.

References

Limiting references

This place does not cover:

Armour plates (for inserting into a vest)	F41H 5/00
Shields for personal use	F41H 5/08
Professional, industrial or sporting protective garments	A41D 13/00
Footwear for use in minefields	A43B 3/0026
Clothing for protection against chemical warfare	A62B
Body protectors for players and sportsmen	A63B 71/08

F41H 1/04**Protection helmets (crash helmets [A42B 3/00](#))****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Crash helmets	A42B 3/00
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F41H 1/08**of plastics; Plastic head-shields****Definition statement***This place covers:*

Plastics is to be construed as including all the fibre reinforced multilayer helmets

F41H 3/00

Camouflage, i.e. means or methods for concealment or disguise (for vessels [B63G 8/34](#), [B63G 13/02](#) {; sound camouflage, i.e. simulating gun fire noise, [F41A 33/04](#); dummy or decoy targets [F41J](#); chaff per se [F41J 2/00](#); ammunition for dispensing chaff [F42B 5/15](#), [F42B 12/70](#); radar absorbing fabrics [H01Q 17/005](#)})

Definition statement*This place covers:*

Includes passive camouflage, i.e. covers, nets, garments , as well as active, electronic camouflage and shielding.

Includes camouflage in the visible and in the infrared spectrum.

Includes camouflage patterns.

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Apparatus for generating fog or smoke screens	F41H 9/06
Camouflage for underwater vessels	B63G 8/34
Camouflage for other marine vessels	B63G 13/02
Arrangements for military shielding in aircraft	B64D 7/00
Sound camouflage, i.e. simulating gun fire noise	F41A 33/02
Dummy or decoy targets	F41J
Chaff per se	F41J 2/00
Cartridged ammunition for dispensing chaff	F42B 5/15
Smoke pot projectors	F42B 5/155

Smoke producing projectiles	F42B 12/48
Cargo ammunition for dispensing chaff	F42B 12/70
Radar absorbing fabrics	H01Q 17/005

F41H 5/00

Armour; Armour plates (processes for manufacturing or treating [B21](#), [C21](#), {heat treatment [C21D 9/42](#); wall or panel structure for safes [E05G 1/024](#)})

Definition statement

This place covers:

This main group includes the aspects of composition, configuration and the mounting of the armour elements.

It further includes the aspects of application/use of armours, e.g. as shields, turrets, manhole covers or windows

References

Limiting references

This place does not cover:

Armoured vehicles	F41H 7/00
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Mechanical metal-working without essentially removing material, punching metal	B21
Metallurgy of iron	C21
Heat treatment for armour plates	C21D 9/42
Wall or panel structure for safes	E05G 1/024

F41H 5/007

Reactive armour; Dynamic armour

Definition statement

This place covers:

Includes armour using liquid and the blast or shockwave mitigation effects of a fluid e.g. by rheological properties

Includes armour using electrical fields for the incapacitation of warheads

Includes armour with dilatant, materials or other chemically reactive substances in layers.

Includes pyrotechnically reactive substances.

Includes dynamic armour, i.e. elastically reacting armour.

Includes systems for intercepting incoming projectiles or missiles, i.e. active armour.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

ERA	often used in the field for explosive reactive armour.
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F41H 5/023

{Armour plate, or auxiliary armour plate mounted at a distance of the main armour plate, having cavities at its outer impact surface, or holes, for deflecting the projectile}

Definition statement

This place covers:

Also includes slat armour and nets for protection against hollow charge projectiles such as rocket propelled grenades (RPG).

F41H 5/04

composed of more than one layer {(outerwear resistant to mechanical aggressions [A41D 31/24](#); layered products [B32B](#); shaping reinforced articles [B29C 67/00](#))}

Definition statement

This place covers:

Layered armour where the armour effect is enhanced by the mechanical impedance discontinuities between the layers.

References

Limiting references

This place does not cover:

Outerwear resistant to mechanical aggressions	A41D 31/24
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping reinforced articles	B29C 67/00
Layered products, i.e. layers built up from strata of flat or non-flat, e.g. cellular or honeycomb, form	B32B

Synonyms and Keywords

In patent documents, the following words/expressions are often used with the meaning indicated:

"plastic layers"	"plastic films, foam layers, rubber layers, elastomeric layers, thermoplastic and duroplastic layers"
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F41H 5/0414**{Layered armour containing ceramic material}****Definition statement***This place covers:*

The ceramic being the main armour component, meaning the stopping action of the projectile is mainly performed by the ceramic layer(s).

Includes surface mounted interlocking or abutting ceramic tiles.

Also includes glass ceramics.

References**Limiting references***This place does not cover:*

Ceramic elements embedded in a matrix	F41H 5/0492
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F41H 5/0442**{Layered armour containing metal (in combination with ceramic layers [F41H 5/0421](#); heat treatment of armour plate [C21D 9/42](#))}****Definition statement***This place covers:*

The metal being the main armour component, meaning the stopping action of the projectile is mainly performed by the metal layer(s)

References**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Ceramic armour in combination with metal layers	F41H 5/0421
Heat treatment for armour plates	C21D 9/42

F41H 5/0471**{Layered armour containing fibre- or fabric-reinforced layers (in combination with ceramic layers [F41H 5/0428](#), with metal layers [F41H 5/0457](#))}****Definition statement***This place covers:*

The fibrous layer(s) or tapes being the main armour component, meaning the stopping action of the projectile is mainly performed by the fibrous layer(s) or tapes.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Ceramic armour in combination with additional metal layers	F41H 5/0421
Metal armour in combination with additional fibre or fabric-reinforced layers	F41H 5/0457

F41H 5/0492

{Layered armour containing hard elements, e.g. plates, spheres, rods, separated from each other, the elements being connected to a further flexible layer or being embedded in a plastics or an elastomer matrix}

Definition statement

This place covers:

The layer with the plurality of hard elements, possibly within a matrix, being the main projectile stopping layer.

Also includes chain mail type armour with linked or engaging rings or platelets

References

Limiting references

This place does not cover:

Ceramic armour comprising externally mounted, full-body covering ceramic tiles	F41H 5/0414
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Special rules of classification

This group is restricted to the aspect of a plurality of hard elements acting together to stop a projectile.

Documents classified in this group should also have a material specific class attributed in [F41H 5/0414](#) or [F41H 5/0442](#)

F41H 5/10

Spade bayonets, i.e. usable as a spade, bayonet or cover against rifle fire {(not used; see [F41C 27/04](#))}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements for mounting spades or shields on smallarms	F41C 27/04
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Special rules of classification

NOT IN USE

Antiquated, obsolete entry from the beginning of the IPC, ignore for search.

F41H 5/22

Manhole covers, e.g. on tanks; {Doors on armoured vehicles or structures}

Definition statement

This place covers:

Includes locking systems for doors on armoured vehicles.

References

Limiting references

This place does not cover:

Mounting of windows on armoured vehicle doors	F41H 5/26
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F41H 5/26

Peepholes; Windows; {Loopholes} (manufacture or composition of glass [C03](#); Covers therefor {informative reference: transparent bullet-proof laminates [F41H 5/0407](#); layered products essentially comprising glass [B32B 17/06](#)})

Definition statement

This place covers:

Includes observation means incl. camera's and periscopes on vehicles

Includes locking systems for AFV doors

mounting armoured transparent panels in vehicle body or doors frames to protect interface gaps

gunports not being/having ball or swivel mounts

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Transparent bullet-proof laminates	F41H 5/0407
Doors on manhole covers	F41H 5/22
Layered products essentially comprising glass	B32B 17/06
Manufacture or composition of glass	C03
Bearings for supporting a pivoting gun in a wall, e.g. a turret wall (ball or swivel mount)	F41A 27/10

F41H 7/00

Armoured or armed vehicles (general vehicle aspects [B60](#); armoured or armed ships [B63G](#); armoured or armed aircraft [B64D](#); mounting guns, e.g. machine guns, on vehicles [F41A 23/00](#))

Definition statement

This place covers:

Includes in principle all tactical military, para-military or police vehicles, i.e. the ones being armoured against aggression and the ones serving as a mobile weapon platform.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Layered armour	F41H 5/04
General vehicle aspects	B60
Special military vehicles like armoured bridge layers or tank transporters	B60P
Armoured or armed ships	B63G
Armoured or armed aircraft	B64D
Mounting guns, e.g. machine guns, on vehicles	F41A 23/00
Turrets	F41A 27/00

Special rules of classification

Vehicles which are not armoured but only armed should be classified in the main group [F41H 7/00](#), if applicable with a double classification in the group pertinent to the weapon mounted on the vehicle.

F41H 7/005

{Unmanned ground vehicles, i.e. robotic, remote controlled or autonomous, mobile platforms carrying equipment for performing a military or police role, e.g. weapon systems or reconnaissance sensors ([F41H 11/16](#) takes precedence)}

References

Limiting references

This place does not cover:

Self-propelled mine-clearing vehicles	F41H 11/16
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Steering control for unmanned (ground) vehicles	B62D 1/283
Remote controlled aircraft	B64C 39/024

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

UAV	Unmanned arial vehicle
UGV	Unmanned ground vehicle
USV	Unmanned surface vessels
UUV	Unmanned undersea vehicle

F41H 7/035

{Gratings for ventilation openings}

Definition statement

This place covers:

Gratings or similar covers for air inlet, respectively air outlet, openings on an armoured vehicle, the covers offering protection against ballistic threats while still permitting air to flow into and out of the vehicle.

References

Limiting references

This place does not cover:

Slat armour; Nets	F41H 5/026
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Ventilating openings in vehicle exterior; Ducts for conveying ventilating air	B60H 1/28
Air scoops	B60H 1/30

F41H 7/042

{Floors or base plates for increased land mine protection}

Definition statement

This place covers:

Specially formed or reinforced outer bottom walls of a vehicle body, e.g. V-shaped for blast deflection;

Special assemblies located on the inside of the outer bottom wall of the vehicle body for mitigating the blast wave, resulting from a mine or IED explosion, e.g. deformable assemblies such as honeycomb structures.

Floor plates for the passenger cell not connected to the outer bottom wall or blast wave mitigating assemblies.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Protecting loads on vehicles against shocks in general	B60P 7/16
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F41H 9/00

Equipment for attack or defence by spreading flame, gas or smoke {or leurres}; Chemical warfare equipment (protection against chemicals [A62B](#))

Definition statement

This place covers:

Offensive and defensive equipment using dispersion of gas, smoke, fog, aerosols including the projection of flames by sustained fuelling of a burning directional flame.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Protection against chemical warfare	A62B
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F41H 9/06

Apparatus for generating artificial fog or smoke screens ({for producing special effects on stages [A63J 5/00](#)}; smoke-pot projectors, e.g. arranged on vehicles, [F42B 5/155](#))

Definition statement

This place covers:

Stationary or vehicle borne apparatus generating a sustained flow of fog or smoke, the apparatus containing large quantities of smoke-generating agent, which generally would inhibit it being carried around by an individual.

References

Limiting references

This place does not cover:

Smoke pot projectors	F42B 5/155
Projectiles producing smoke	F42B 12/48

Informative references

Attention is drawn to the following places, which may be of interest for search:

Camouflage (active, using smoke screens)	F41H 3/00
Devices for producing special effects on stages	A63J 5/00

F41H 9/10

Hand-held or body-worn self-defence devices using repellant gases or chemicals

Definition statement

This place covers:

Portable device used by an individual for self-defence dispensing an aerosol, or a cloud of repellant gases or chemicals, such as pepper spray (OC), malodorant chemicals, chemicals inducing nausea, colouring agents (markers), diluted acids, etc.

Such a hand-held device may be in the form of a pressurised spraying can or it might be integral or attached to a weapon, an accessory or a personal shield.

A body-worn device may be in the form of an arm band, a bracelet or a ring, or eventually integrated in a back pack, a body armour, a piece of protective clothing or similar.

Special rules of classification

Self defence spraying devices integrated into weapons, accessories or protective shields must be double classified in the respective groups.

F41H 11/00

Defence installations; Defence devices (constructional aspects see Section [E](#), e.g. {air-raid shelters} [E04H 9/04](#); {protective arrangements for buildings} [E04B 1/92](#); extinguishing or preventing the spread of fire from, incendiary bombs [A62C 3/06](#); dynamic armour [F41H 5/007](#); ballistically deployed systems for restraining persons or animals [F41H 13/0006](#); electronic countermeasures [G01S](#)}}

Definition statement

This place covers:

Active and passive defensive installations except conventional shields, armours and shelters.

Includes areal barrages, harbour nets, obstacles and minefields.

Includes demining methods and devices.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Reactive armour; Dynamic armour	F41H 5/007
Ballistically deployed systems for restraining persons or animals	F41H 13/0006
Extinguishing or preventing the spread of fire from, incendiary bombs	A62C 3/06
Protective arrangements for buildings	E04B 1/92
Air-raid shelters	E04H 9/04
Electronic counter measures	G01S
Constructional aspects. Civil engineering aspects	E

F41H 11/02

Anti-aircraft or anti-guided missile {or anti-torpedo} defence installations or systems (cartridges or missiles for producing smoke or for dispensing radar chaff or infrared material [F42B 5/15](#), [F42B 12/48](#), [F42B 12/70](#); {informative reference: details of radar or sonar systems [G01S 7/00](#); jamming or electronic countermeasures [G01S 7/38](#), [G01S 7/495](#), [H04K 3/00](#)})

Definition statement

This place covers:

Active systems or installation capable of destroying, neutralising or deviating incoming missiles.

Hard-kill methods includes the physical destruction of the incoming missile with perforating, fragmenting or high explosive projectiles.

Soft-kill methods include missile neutralisation by influencing the missile's electronic homing and initiation systems (jamming, blinding, altering) or to mislead the incoming missile's sensory system with decoys so as to avoid it's impact with the object to be protected.

References

Limiting references

This place does not cover:

Cartridges for dispensing radar chaff or infrared material	F42B 5/15
Missiles for producing smoke	F42B 12/48
Missiles for dispensing radar chaff or infrared material	F42B 12/70

Informative references

Attention is drawn to the following places, which may be of interest for search:

Armour comprising elements mounted at a distance from the main object, e.g. slat armour for catching or disrupting hollow charge projectiles	F41H 5/023
Details of radar or sonar systems	G01S 7/00
Jamming means, e.g. producing false echoes	G01S 7/38
Counter-measures or counter-counter-measures using electronic or electro-optical or optronic means	G01S 7/495
Jamming of communication; Counter-measures	H04K 3/00

F41H 11/04

Aerial barrages

Definition statement

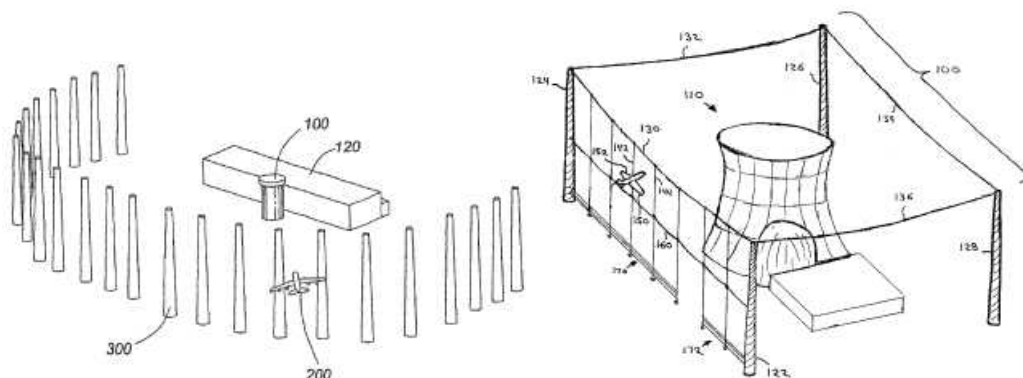
This place covers:

Barriers prohibiting the passage of aircraft and missiles.

The might be configured as:

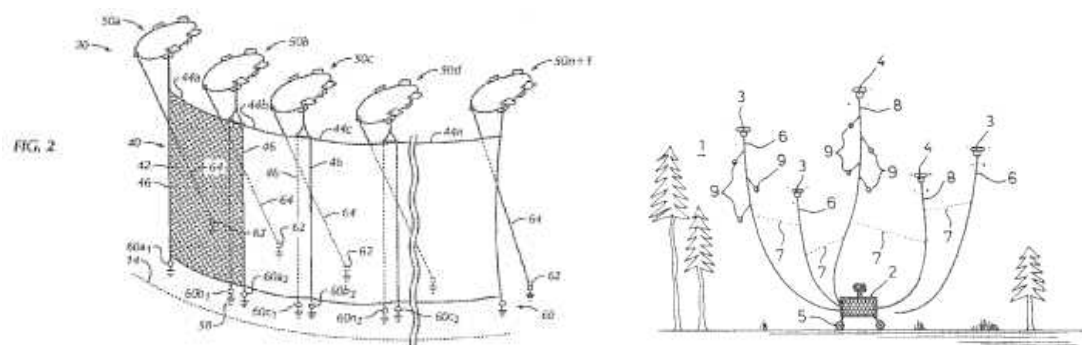
Definition statement

rigid ground fixed structures,



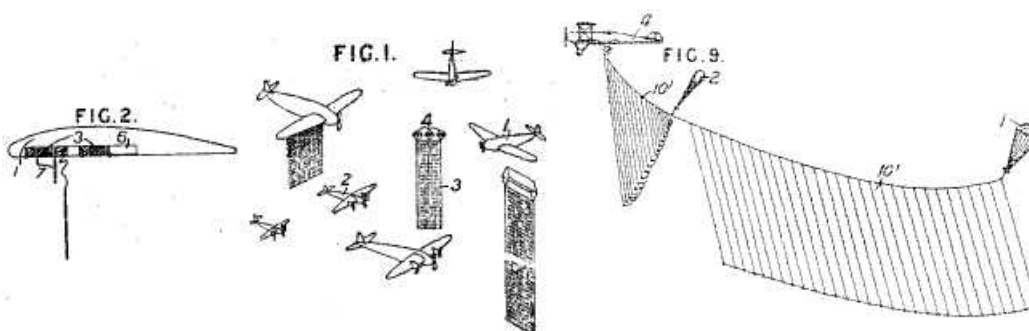
WO03036220 US2004050014

nets supported by floating balloons or airships and tethered to the ground,



WO2010117393 DE4214201

nets towed by or jettisoned from aircraft.



GB529623 GB129329

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Ballistically deployed restraining systems, e.g. nets	F41H 13/0006
Chain shot, i.e. submissiles interconnected by chains or the like	F42B 12/66

F41H 11/08

Barbed-wire obstacles; Barricades; Stanchions; Tank traps; Vehicle-impeding devices; Caltrops {(making barbed wire [B21F 25/00](#); barbed-wire fencing [E04H 17/04](#); road barricades, obstructing passage of vehicles or pedestrians [E01F 13/00](#))}

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Making barbed wire	B21F 25/00
Road barricades, obstructing passage of vehicles or pedestrians	E01F 13/00
Forcibly arresting or disabling vehicles	E01F 13/12
Barbed-wire fencing	E04H 17/04

F41H 11/16

Self-propelled mine-clearing vehicles; Mine-clearing devices attachable to vehicles

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Robotic vehicles	F41H 7/005
Earthmoving vehicle aspects	E02F 3/76

Special rules of classification

Devices for remotely destroying mines, i.e. magnetic field generators, sound wave devices, flame throwing devices, IR lures	F41H 11/32
Disruptors	F41B 9/0046

F41H 11/28

using brushing or sweeping means or dozers to push mines lying on a surface aside; using means for removing mines intact from a surface

Definition statement

This place covers:

May include magnets for picking up ferro magnetic items and gripping means for picking up or handling items.

F41H 11/32

Decoy or sacrificial vehicles; Decoy or sacrificial devices attachable to vehicles

Definition statement

This place covers:

Includes magnetic means for creating a magnetic field "lure/decoy" for triggering mines or other non-contact devices for remotely exploding mines or unexploded ordnance (UXO).

Includes sound wave devices, IR-lures, water jets or other devices for triggering potential contact or proximity sensors in a mine.

References

Limiting references

This place does not cover:

Directed energy weapons	F41H 13/0043
Disruptors	F41B 9/0046

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

UXO	Unexploded ordnance
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F41H 13/00

Means of attack or defence not otherwise provided for {(details of radar or sonar systems [G01S 7/00](#))}

Definition statement

This place covers:

Includes ballistically deployed restraining systems, directed energy weapons and electro-shock weapons.

Includes acoustic weapons.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Electric shock devices, e.g. cattle prods	A01K 15/02
Batons with electric stunning means	F41B 15/04
Details of radar or sonar systems	G01S 7/00
Laser devices	H01S

F41H 13/0006

{Ballistically deployed systems for restraining persons or animals, e.g. ballistically deployed nets}

Definition statement

This place covers:

Including ballistically deployed nets for restraining surface vessels.

Including ballistically deployed nets for catching aerial vehicles.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Aerial barrages	F41H 11/04
Chain shot projectiles	F42B 12/66

F41H 13/0012

{Electrical discharge weapons, e.g. for stunning}

Definition statement

This place covers:

Including documents concerning remote discharge via ionised beams.

F41H 13/0018

{for nearby electrical discharge, i.e. the electrodes being positioned on the device and the device brought manually or otherwise into contact with a nearby target (batons with electric discharge capability [F41B 15/04](#); electric shock devices for animals [A01K 15/02](#))}

Definition statement

This place covers:

Including devices for administering an electrical shock to the wearer of the device.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Electric shock devices, e.g. cattle prods	A01K 15/02
Batons with electric discharge capability	F41B 15/04

F41H 13/0043

{Directed energy weapons, i.e. devices that direct a beam of high energy content toward a target for incapacitating or destroying the target}

Definition statement

This place covers:

Weapons which use an energy beam for achieving an effect on the target, as opposed to physical projectiles impacting the target.

References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Mine clearing remotely by means of directed energy weapons	F41H 11/32
Counter-measures or counter-counter-measures using electronic or electro-optical or optronic means	G01S 7/495

F41H 13/005

{the high-energy beam being a laser beam}

Definition statement

This place covers:

Also includes documents concerning laser as enabling technology.

F41H 13/0081

{the high-energy beam being acoustic, e.g. sonic, infrasonic or ultrasonic}

Definition statement

This place covers:

Devices and methods for producing focused acoustical beams or fan shaped diverging beams. Not omni-directional sound producing devices.