

Non-lethal weapon

The invention relates to a non-lethal weapon,
which fires impact projectiles with adjustable kinetic
5 energy.

Non-lethal weapons are used, for example, by
police forces in order to incapacitate people, but on
no account to kill them. Typical distances for the use
of such weapons are 10 to 100 m. Ammunition which
10 takes out, but does not kill, a person at a distance of
80 m, for example, is lethal at a distance of 20 m. In
order to avoid danger to people, ammunition is used
with different propellant charges for different
distance ranges. If action is taken against people at
15 different distances, therefore, the type of ammunition
has to be changed. This requires an extensive supply
of ammunition. Because of the different ammunition, it
can happen, particularly in situations of stress, that
the ammunition gets mixed up, so that in the worst
20 case, people can be killed.

The underlying object of the invention is to
develop a non-lethal weapon which requires only one
type of ammunition for different distance ranges.

This object is achieved in accordance with the
25 invention with the features of claim 1.

The weapon in accordance with the invention has a
barrel for firing impact projectiles, a sighting device
for detecting targets and a distance measuring device
for determining the target distance, and also a control
30 device. The control device alters the energy of the
shot as a function of a distance signal, which is sent
by the distance measuring device to the control device.
Because the energy of the shot is changed, one type of
ammunition can be used for all distances. Fatal shots
35 cannot be delivered by mistake, because the control
device adapts the impact energy of the projectile to

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the respective distance as a function of the distance signal.

In a preferred embodiment of the invention, at least one discharge valve is provided in the barrel, through which discharge valve, depending on the valve position, a portion of the pressure which is generated by the propellant charge and expels the projectile from the barrel can escape. The discharge valve is opened and closed by the control device as a function of the target distance which is measured. By means of the position of the valve, the pressure generated by the propellant charge can, for example, be regulated in a continuously adjustable manner from full pressure (valve closed) to low pressure (valve wide open). Thus, the energy of the shot can be adapted to the respective target distance in a continuously adjustable manner or in stepped manner.

The impact projectile can also be programmed by the control device in order to adjust the energy of the shot. The projectile has, for example, a plurality of propellant charges which can be selected individually by the control device. If the target is in the lower distance range, only one propellant charge is ignited. In the case of a target which is further away, then depending on the distance, a plurality of propellant charges are activated by the control device.

Preferably, the sighting device is also adjusted by the control device, so that the longitudinal axis of the barrel and the line of sight of the sighting device intersect at one point on the target. The tracking of the sighting device as a function of the distance of the target has the advantage that a very precise aim is possible for all distances.

The distance measuring device can be a laser distance meter, with the wavelength which is used lying in the visible range. As a result of this, it is

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possible for the distance measuring device to be used as a sighting device as well.

Advantageously, the impact energy of the projectile on a target which is stationary at a certain distance can be altered. Thus, the impact energy can be adapted, for example, to the clothing of the person who is to be incapacitated.

In the following, an exemplary embodiment of the invention is explained in greater detail with reference to the drawing, in which:

Figure 1 shows a diagrammatic representation of a non-lethal weapon.

The non-lethal weapon 1 shown in Figure 1 has a barrel 2 for shooting impact projectiles 3. Fastened to the barrel 2 is a distance measuring device 4, which measures the distance to the target 5, for example with a laser beam. The distance measuring device 4 sends a distance signal to a control device 6. As a function of the target distance, the control device 6 opens or closes, respectively, a discharge valve 7 which is fastened to the barrel 2.

A projectile 3 located in the barrel 2 has a propellant charge which is ignited when the projectile is fired. The tube 2 and the projectile located therein form a hollow chamber 8, in which the propellant charge builds up a gas pressure which expels the projectile 3 from the barrel 2. In the region of this hollow chamber 8, the discharge valve 7 is set into the wall of the barrel 2. With the discharge valve 7, the pressure in the hollow chamber 8 can be reduced and in this way the impact energy of the projectile 3 on the target 5 is adjusted. The propellant charge is dimensioned in such a way that, in the case of maximum target distance, the projectile 3 has at least the desired impact energy. The cross-section of the discharge valve 7 is designed in such a

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way that in the case of minimum target distance, so much gas can escape that an endangering of people is eliminated.

The target 5 can be detected with a sighting
5 device 9, which is here constructed as an optical
telescopic sight. The sighting device 9 is pivoted
about a horizontal axis with a pivoting device 10, so
that the line of sight 11 can be adjusted in the plane
of the drawing. The pivoting device 10 is controlled
10 by the control device 6 as a function of the target
distance.

When the non-lethal weapon 1 is used, the weapon 1
is aimed at the target 5. The distance measuring
device 4 measures the distance to the target 5 and
15 passes a distance signal to the control device 6. This
thereupon opens the discharge valve 7, which is a flow
control valve, as a function of the target distance,
until the degree of opening necessary for the required
pressure is achieved. Furthermore, the control device
20 6 pivots the sighting device 9. The sighting device 9
is adjusted in such a way that the line of sight 11
intersects the path 12 of the projectile at a target
point 13 which is located on the surface of the target
5. This renders possible a very precise aim over
25 different distance ranges. The marksman can now
release the shot. In order to do this, he presses a
trigger, which initiates an igniting mechanism which
ignites the propellant charge of the projectile 3. The
propellant charge builds up a pressure in the hollow
30 chamber 8, which pressure is kept by the flow control
valve 7 at a predetermined value which is dependent on
the distance of the target 5. This pressure expels the
projectile 3 from the barrel 23 (sic) and allows the
projectile 3 to hit the target 5 at the target point 13
35 with a certain impact energy.

The discharge valve 7 can also be realised as a

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valve which has only two positions. In a first position, the discharge valve 7 is completely closed. In the second position, the discharge valve 7 is fully opened. The control device 6 calculates the time delay
5 for the opening of the discharge valve 7 as a function of the distance signal. By pressing the trigger, the propellant charge of the projectile 3 is activated, so that a pressure builds up in the hollow chamber 8. This pressure, which continues to build up, pushes the
10 projectile 3 into the barrel 2. After a certain time span, the discharge valve 7 is completely opened, so that the pressure escapes from the hollow chamber 8. The energy of the shot is therefore regulated as a result of the fact that the pressure in the hollow
15 chamber 8 is present only for a certain duration, depending on the distance of the target 5, in order to accelerate the projectile 3.

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Claims

1. Non-lethal weapon (1) having a barrel (2) for firing impact projectiles (3), having a sighting device (9) for detecting targets (5), characterised in that
5 there is provided a distance measuring device (4) for determining the target distance, which delivers a distance signal to a control device (6), and in that the control device (6) alters the energy of the shot as a function of the distance signal in such a way that
10 the impact energy of the projectile (3) on the target (5) in the case of different distances is substantially equal.

2. Non-lethal weapon according to claim 1, characterised in that in order to alter the gas
15 pressure distribution in the barrel (2), there is provided at least one discharge valve (7) in the barrel (2), the opening position of which can be adjusted by the control device (6) as a function of the target distance.

20 3. Non-lethal weapon according to claim 1, characterised in that in order to adjust the energy of the shot, the impact projectile (3) can be programmed by the control device (6).

25 4. Non-lethal weapon according to one of claims 1 to 3, characterised in that the sighting device (9) is adjusted by the control device (6) as a function of the target distance, in order to unite the line of sight (11) with the line (12) of the projectile at the target point (13).

30 5. Non-lethal weapon according to one of claims 1 to 4, characterised in that the distance measuring device (4) is a laser distance meter.

35 6. Non-lethal weapon according to claim 5, characterised in that the laser distance meter operates in the optically visible range, and in that the distance measuring device (4) simultaneously forms the





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sighting device.

7. Non-lethal weapon according to one of claims 1 to 6, characterised in that the energy of the shot is manually adjustable, in order thus to alter the impact energy of the projectile (3) on the target (5).

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