

(12) **EUROPEAN PATENT APPLICATION**

(51) Int Cl.: **E01F 9/07** (2006.01) **E01F 9/047** (2006.01)
E01F 13/12 (2006.01)

(22) Date of filing: 11.04.2008

(71) Applicant: **Kelly, Alan**
Castleknock Dublin 15 (IE)

(72) Inventor: **The designation of the inventor has not yet been filed**

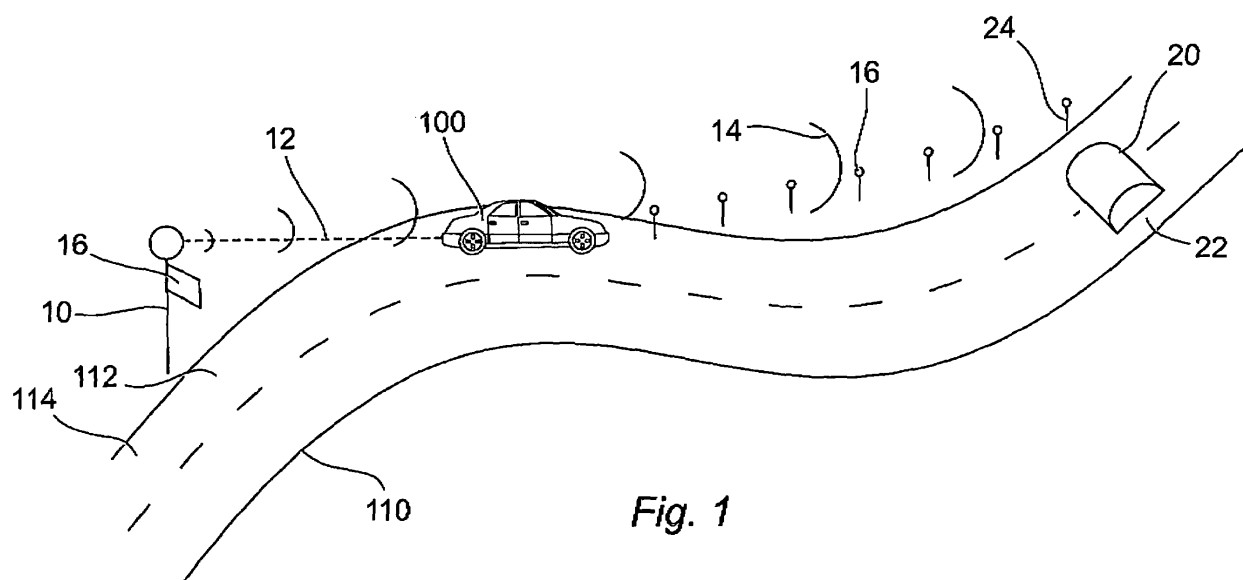
(74) Representative: **Armstrong, Rosemary**
Murgitroyd & Company
165-169 Scotland Street
Glasgow G5 8PL (GB)

(30) Priority: 13.04.2007 GB 0707164

(54) **Vehicle speed reducing device**

(57) A vehicle speed reducing device, comprising: a roadside member provided at or adjacent to a first location along a path, the roadside member being adapted to selectively provide a first signal corresponding to a status of the roadside member; an obstructing member provided at a second location along the path, the obstructing member having an upper surface, wherein the upper surface of the obstructing member is movable be-

tween a first position in which the upper surface is substantially vertically level with the path surface and a second position in which the upper surface is vertically spaced from the path surface; and control means adapted to receive the first signal and responsively co-operate with the obstructing member so that the upper surface of the obstructing member is movable towards either the first or the second position when contacted by a vehicle.



Description

[0001] The present invention relates to apparatus and methods for reducing the speed of a vehicle, either indirectly by providing an obstacle which encourages the vehicle driver to slow down or directly by providing an obstacle which actively contributes to slowing the vehicle. In particular, but not exclusively, the invention relates to barriers, ramps, speed bumps, speed tables, speed cushions, rumble strips and the like.

[0002] It is known to provide speed bumps and the like on public roads as a traffic calming measure to enforce a particular speed limit for that road. Vehicle drivers are aware that driving a vehicle over the speed bump at a speed in excess of the limit can cause discomfort and/or damage to the vehicle. The speed bumps therefore encourage the vehicle driver to slow down as they approach the speed bump. The speed bump therefore reduces the speed of a vehicle indirectly by providing an obstacle which encourages the vehicle driver to slow down.

[0003] Known speed bumps are usually static and rigid in construction. They are known to be a source of inconvenience, distraction and noise, even when drivers are observing the speed limit. They do not differentiate between drivers who are observing the speed limit and those who are not (in the sense that both sets of drivers must drive over the speed bump and accept a degree of discomfort). In particular, even emergency vehicles must reduce speed which causes a delay for the vehicle to reach an emergency.

[0004] Furthermore, the size and shape of the speed bump is selected to enforce a particular speed limit. However, there is no possibility of altering these properties, other than replacement of the speed bump. Altering the properties may be desirable for a number of reasons, such as because the speed limit of the road is amended. It would often be desirable to only deploy the speed bump at particular times of day, but this is not possible with conventional speed bumps. Examples of this include school starting and finishing times, or when a traffic light is at red, or when weather conditions are unfavourable. It is desirable to provide a speed bump or the like which can be selectively deployed.

[0005] Furthermore, typically a single speed bump is provided on a road. Its construction is such that it would actively contribute to reducing the speed of a vehicle when the driver does not do so voluntarily. This is because the bump is sufficiently large that some of the vehicle's forward motion would be resolved to a lesser force in the direction of motion and also a vertical force. However, this is not the speed bump's intended purpose, and a single speed bump would not provide much contribution. Also, the construction of a typical speed bump is too severe to safely slow a vehicle without causing damage. It is also known to provide rumble strips on roads which comprise a plurality of small bumps. However, the purpose of rumble strips is to provide tactile information to the driver that the present speed may be excessive. Due

to its size and shape, each bump makes an insignificant contribution to actively slowing the vehicle. Thus rumble strips also reduce the speed of a vehicle indirectly by encouraging the vehicle driver to slow down.

[0006] It is desirable to provide a plurality of bumps which are suitably sized and shaped to significantly but safely contribute to slowing a vehicle. This vehicle may be, for instance, an aeroplane on a runway.

[0007] Also known are speed cameras and other sensors which measure the speed of a vehicle. They are often used to take a photograph of a speeding vehicle. Speed bumps and cameras are conventionally viewed as alternatives to one another.

[0008] According to a first aspect of the present invention, there is provided a vehicle speed reducing device, comprising:

a roadside member provided at or adjacent to a first location along a path, the roadside member being adapted to selectively provide a first signal corresponding to a status of the roadside member; an obstructing member provided at a second location along the path, the obstructing member having an upper surface,

wherein the upper surface of the obstructing member is movable between a first position in which the upper surface is substantially vertically level with the path surface and a second position in which the upper surface is vertically spaced from the path surface; and

control means adapted to receive the first signal and responsively co-operate with the obstructing member so that the upper surface of the obstructing member is movable towards either the first or the second position when contacted by a vehicle.

[0009] The roadside member may be adapted to selectively provide the first signal to a plurality of obstructing members.

[0010] Preferably the roadside member comprises a sensor adapted to detect the speed of a vehicle travelling along the path surface, and to provide the first signal when the detected speed is above a predetermined value. The status of the sensor may be either that speed above the predetermined value has been detected or not detected. Preferably the sensor comprises a speed camera.

[0011] Alternatively, the sensor may comprise one or more magnetic sensors. Alternatively, the sensor may comprise one or more pressure wires which cross the path at the first location. Alternatively or in addition the sensor may be adapted to sense one or more of visibility, temperature, a rain fall level and air moisture content.

[0012] Alternatively the roadside member may comprise an indicator member. The indicator member may comprise a traffic light have at least two of red, amber and green statuses.

[0013] Preferably the control means is adapted to re-

ceive the first signal via a cable. Alternatively the device may include transmitting and receiving means for broadcasting the first signal from the sensor to the control means.

[0014] Preferably the device includes indicating means. Preferably the indicating means is adapted to indicate the presence of the obstructing member. Preferably the indicating means is adapted to indicate whether the upper surface is at the first or the second position.

[0015] According to a first embodiment of the invention, preferably the obstructing member is movable towards the first position when contacted by a vehicle.

[0016] Preferably the obstructing member comprises a bladder member provided at the second location. Preferably the bladder member is formed from a resilient material which defines a reservoir for a fluid. Preferably the fluid is substantially incompressible. Preferably the fluid is a hydraulic fluid. Alternatively the fluid may be air.

[0017] Preferably the resilient material of the bladder member defines the upper surface. Alternatively a cover member is provided for covering the bladder member.

[0018] Preferably the obstructing member is provided at the path such that the upper surface of the obstructing member is at the second position in which the upper surface is vertically spaced from the path surface.

[0019] Preferably a plurality of bladder members are provided, the bladder members arranged sequentially to substantially cross the path.

[0020] Preferably the obstructing member includes a cylinder in fluid communication via one or more conduits with the or each bladder member. Preferably the cylinder includes a piston having a piston head arranged such that pressure within the or each bladder member acts in a first direction upon the piston head. Preferably the cylinder includes biasing means for biasing the piston head towards the opposite direction.

[0021] Preferably the obstructing member includes valve means interposing the or each bladder member and the cylinder. Preferably the valve means has an open and a closed position and is controllable using the control means.

[0022] Preferably the valve means comprises a first valve which is normally open and the control means is adapted to close the first valve in response to receiving the first signal.

[0023] Preferably the control means is adapted to receive an override signal. Preferably the control means is adapted such that the control means does not close the first valve in response to receiving both the first signal and the override signal.

[0024] Alternatively the valve means further comprises a second valve which is fluidly arranged in parallel with the first valve and which is normally closed. Preferably the control means is adapted to open the second valve in response to receiving at least the override signal.

[0025] The control means may include timing means such that the control means does not close the first valve or the control means opens the second valve in response

to receiving the first signal.

[0026] Preferably the device includes power supply means for at least the control means. Preferably the power supply means is provided at the second location. Preferably the power supply means comprises a rechargeable battery.

[0027] Preferably the device is adapted to convert retraction and/or expansion of the piston to electrical energy. The electrical energy may be used for recharging the battery. Preferably the piston includes an external extending portion. Preferably the external extending portion includes a plurality of linear teeth. Preferably power supply means includes a generator member. Preferably the generator member includes a cog member having rotational teeth adapted to mate with the linear teeth such that retraction and/or expansion of the piston rotates the cog member to generate electrical energy. The electrical energy may be used for recharging the battery.

[0028] Preferably the device is adapted such that a portion of the fluid within one or more bladder members is pressed out of the or each bladder member and into one or more of the conduits when the valve is at the open position and when the upper surface is contacted by the vehicle thus allowing the upper surface to move towards the first position.

[0029] Preferably the pressure within the or each bladder member and the resilience of the biasing means is predetermined such that fluid which is pressed out of the or each bladder member and into one or more of the conduits acts upon the piston head to retract the piston against the biasing means when the valve is at the open position and when the upper surface is contacted by the vehicle. Preferably the biasing means is adapted to subsequently expand the piston when the valve is at the open position and when the upper surface is no longer being contacted by the vehicle thus returning the upper surface to the second position.

[0030] Preferably the device is adapted such that fluid within the or each bladder member cannot escape into one or more of the conduits when the valve is at the closed position when the upper surface is contacted by the vehicle thus allowing the upper surface to remain at the second position.

[0031] Preferably the obstructing member includes an access point for accessing the fluid system. Preferably the access point fluidly interposes the cylinder and the valve means. Preferably the access point includes pressure adjustment means for one or both of increasing and decreasing the pressure within the system.

[0032] According to a second embodiment of the invention, preferably the obstructing member is movable towards the second position when contacted by a vehicle.

[0033] Preferably the obstructing member comprises a bladder member containing a fluid. The bladder member may be formed from a resilient material which defines a reservoir for a fluid.

[0034] Preferably the obstructing member includes a platform member which defines the upper surface. Pref-

erably the platform member is supported by the bladder member. Alternatively the platform member may be supported by a second biasing means which biases the platform member towards the first position.

[0035] Preferably a plurality of bladder members are provided, the bladder members arranged sequentially to substantially cross the path.

[0036] Preferably the obstructing member includes a cylinder in fluid communication via one or more conduits with the or each bladder member. Preferably the cylinder includes a piston having a piston head arranged such that pressure within the or each bladder member acts in a first direction upon the piston head. Preferably the cylinder includes biasing means for biasing the piston head towards the opposite direction.

[0037] Preferably the obstructing member includes valve means interposing the or each bladder member and the cylinder. Preferably the valve means has an open and a closed position and is controllable using the control means.

[0038] Preferably the valve means comprises a first valve which is normally closed and the control means is adapted to open the first valve in response to receiving the first signal.

[0039] Preferably the control means is adapted to receive an override signal. Preferably the control means is adapted such that the control means does not open the first valve in response to receiving both the first signal and the override signal.

[0040] Alternatively the valve means further comprises a second valve which is fluidly arranged in parallel with the first valve and which is normally open. Preferably the control means is adapted to close the second valve in response to receiving at least the override signal.

[0041] The control means may include timing means such that the control means does not open the first valve or the control means closes the second valve in response to receiving the first signal.

[0042] Preferably the device includes power supply means for at least the control means. Preferably the power supply means comprises a rechargeable battery. Preferably the device is adapted to convert retraction and/or expansion of the piston to electrical energy for recharging the battery.

[0043] Preferably the device is adapted such that a portion of the fluid within one or more bladder members is pressed out of the or each bladder member and into one or more of the conduits when the valve is at the open position and when the upper surface is contacted by the vehicle thus allowing the upper surface to move towards the second position.

[0044] Preferably the pressure within the or each bladder member and the resilience of the biasing means is predetermined such that fluid which is pressed out of the or each bladder member and into one or more of the conduits acts upon the piston head to retract the piston against the biasing means when the valve is at the open position and when the upper surface is contacted by the

vehicle. Preferably the biasing means is adapted to subsequently expand the piston when the valve is at the open position and when the upper surface is no longer being contacted by the vehicle thus returning the upper surface to the first position. Preferably the valve is adapted to close when the upper surface has returned to the first position.

[0045] Preferably the device is adapted such that fluid within the or each bladder member cannot escape into one or more of the conduits when the valve is at the closed position when the upper surface is contacted by the vehicle thus allowing the upper surface to remain at the first position.

[0046] Preferably the obstructing member includes an access point for accessing the fluid system. Preferably the access point fluidly interposes the cylinder and the valve means. Preferably the access point includes pressure adjustment means for one or both of increasing and decreasing the pressure within the system.

[0047] According to a second aspect of the present invention, there is provided a vehicle speed reducing device, comprising:

an obstructing member having an upper surface, wherein the upper surface of the obstructing member is movable between a first position in which the upper surface is substantially vertically level with the path surface and a second position in which the upper surface is vertically spaced from the path surface; and power generating means adapted to convert movement of the upper surface of the obstructing member to electrical energy.

[0048] Preferably the device includes control means for moving the upper surface of the obstructing member towards either the first or the second position. Preferably the device includes power supply means for supplying power to at least the control means. Preferably the power supply means receives electrical energy from the power generating means. Preferably the power supply means comprises a rechargeable battery.

[0049] Preferably the obstructing member comprises a bladder member. Preferably the obstructing member includes a cylinder in fluid communication via one or more conduits with the bladder member. Preferably the cylinder includes a piston having a piston head arranged such that pressure within the bladder member acts in a first direction upon the piston head. Preferably the cylinder includes biasing means for biasing the piston head towards the opposite direction.

[0050] Preferably the piston includes an external extending portion. Preferably the external extending portion includes a plurality of linear teeth. Preferably power generating means comprises a generator member including a cog member. Preferably the cog member comprises rotational teeth adapted to mate with the linear teeth such that retraction and/or expansion of the piston rotates the

cog member to generate electrical energy.

[0051] An embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a first embodiment of a vehicle speed reducing device provided at a path;

Fig. 2 is a sectional side view of an obstructing member of the device of Fig. 1;

Fig. 3 is a plan view of an obstructing member of the device of Fig. 1;

Fig. 4 is a hydraulic circuit for the obstructing member of the device of Fig. 1;

Fig. 5 is an alternative arrangement for the valve means of the obstructing member of the device of Fig. 1;

Fig. 6 is a sectional side view of an obstructing member of a second embodiment of a vehicle speed reducing device with the obstructing member at a first position;

Fig. 7 is a sectional side view of the obstructing member of Fig. 6 at a second position;

Fig. 8 is a hydraulic circuit for the obstructing member of Fig. 6;

Fig. 9 is an alternative arrangement for the valve means of the obstructing member of Fig. 6.

[0052] Fig 1 shows a first embodiment of a vehicle speed reducing device provided at a path or road 110. The device comprises a roadside member in the form of a speed camera 10 provided near to a first location 112 along the road 110. The speed camera 10 detects the speed of a vehicle 100 travelling along the path surface 114 using a speed detection signal 12. The speed camera 10 transmits a first signal 14 to an obstructing member 20 when the detected speed is above a predetermined value which corresponds to the speed limit of the road 110.

[0053] One alternative to a speed camera 10 is a magnetic sensor. For instance, Honeywell sensor HMC 1051 is adapted to sense the speed of a vehicle and provide a signal.

[0054] The obstructing member 20 is provided at a second location 22 along the road 110. A receiver 24 is provided for receiving the transmitted first signal 14.

[0055] Mounted along with the speed camera 10 is an indicating means in the form of a display board 16, for indicating the presence of the obstructing member 20 to oncoming drivers. The display board 16 also indicates whether the obstructing member 20 is at a first or a sec-

ond position as described below.

[0056] As shown in Figs 2 and 3, the obstructing member 20 comprises a bladder member 26 provided in a trough 28 in the road 110. Arrow 121 shows the direction of travel of the vehicle 100. The bladder member 26 is formed from a resilient material such as a rubber membrane which defines a reservoir for a hydraulic fluid 30. A number of bladder members 26 are arranged sequentially to cross the width of the road 110. A conduit or hose 40 is connected to each bladder member 26.

[0057] A cover member 32 is provided for covering all of the bladder members 26 and this defines an upper surface 34. The cover member 32 is also formed from a resilient material, such as vulcanised rubber. The cover member 32 is stretched over the bladder member 26 and secured in place using a number of fixing pins 36 which are hammered into a fixing bar 38. In its normal state, the upper surface 34 of the cover member 32 is expanded upwards by each bladder member 26 such that the upper surface 34 is at a second position, in which the upper surface 34 is vertically spaced by a certain distance 120 from the path surface 114.

[0058] Fig 4 shows a hydraulic circuit for this embodiment. Each of the hoses 40 is in fluid communication with a manifold 42. An outlet hose 44 of the manifold 42 is in fluid communication with a cylinder 46.

[0059] The cylinder 46 includes a piston 48 having a piston head 50 and pressure within the hydraulic circuit acts in a first direction 122 upon the piston head 50. Bi-asing means in the form of a compression spring 52 bi-ases the piston head 50 in an opposite direction 124.

[0060] Valve means, in the form of a first valve 60, is provided between the manifold 42 and the cylinder 46. The first valve 60 is normally open.

[0061] Control means 70 is in communication with the first valve 60 and is adapted to close the first valve 60 in response to receiving the first signal 14.

[0062] When the first valve 60 is open, fluid within a bladder member 26 can be pressed out into the hydraulic circuit when a vehicle 100 drives over the upper surface 34 and deflates the bladder member 26. The pressure within the hydraulic circuit and the resilience of the spring 52 is predetermined to allow this escaped fluid to act upon the piston head 50 and retract the piston 48 against the spring 52. If this occurs, at least a portion of the upper surface 34 (in the vicinity of the vehicle wheel) is free to move from the second position towards the first position.

[0063] Therefore, the vehicle passes over the obstructing member 20 substantially unimpeded if the first valve 60 is open. This is in the absence of the first signal 14 if the vehicle 100 is travelling at or below the speed limit.

[0064] When the vehicle 100 has passed by the obstructing member 20, the load from the vehicle 100 is removed. The spring 52 then expands the piston 48 to its original equilibrium position and forces the escaped air back into the bladder member 26. This has the effect of re-inflating the bladder member 26 and returning the upper surface 34 to the second position. It is to be noted

that the hydraulic circuit is a closed system and fluid never escapes from the overall system.

[0065] However, if the vehicle 100 is travelling above the speed limit, the first signal 14 will be transmitted by the speed camera 10 to the obstructing member 20 and the first valve 60 closes prior to the vehicle 100 reaching the obstructing member 20. In such case, fluid within each bladder member 26 cannot escape and pass the first valve 60 to act upon the piston head 50 when the upper surface 34 is contacted by the vehicle. Thus the upper surface 34 remains at the second position.

[0066] In such case, the bladder member 26 being contacted by the vehicle will not deflate and will effectively provide a rigid speed bump to the speeding driver. This will cause a degree of discomfort to the driver. To avoid future discomfort, the driver is likely to conform to the speed limit when next travelling along the road 110.

[0067] The control means 70 is adapted to receive an override signal 16 from vehicles such as emergency vehicles. If the override signal 16 is received, the control means 70 does not close the first valve 60 even if the first signal 14 has been received.

[0068] Fig. 5 shows an alternative arrangement for the valve means. The valve means includes a second valve 62 arranged in parallel with the first valve 60 and which is normally closed. The control means 70 is connected to both valves and is adapted to open the second valve 62 in response to receiving the override signal 16. Therefore, even if the first valve 60 is closed when a first signal 14 is received, the second valve 62 will be open and fluid can escape past the valve means to act upon the piston head 50 and retract the piston 48. Therefore, the upper surface 34 can move from the second position towards the first position and an emergency vehicle can pass over the obstructing member 20 substantially unimpeded.

[0069] The control means 70 can include timing means to prevent the control means 70 from closing the first valve 60, or from opening the second valve 62 in response to receiving the first signal 14. This allows selective deployment dependent on the time of day, as well as the speed of the vehicle 100. It may be desirable only to deploy the obstructing member 20 around school starting and finishing times, or when weather conditions are unfavourable. Further sensors may be provided to sense parameters such as visibility, temperature, rain fall level and air moisture content. Alternatively such information could be transmitted from a remote central station by road safety personnel.

[0070] Indeed, the roadside member could be a traffic light rather than a speed camera 10 and the obstructing member 20 is only deployed when the traffic light is at red.

[0071] Power supply means 72 is required for at least the control means 70. The power supply means 72 includes a rechargeable battery. The device is adapted to convert retraction and expansion of the piston 48 to electrical energy for recharging the battery. The piston 48 includes an external extending portion which includes a plurality of linear teeth 49. The power supply means 72

also includes a generator and coupled to this is a cog 74. The cog 74 has rotational teeth adapted to mate with the linear teeth of the piston 48 so that retraction and expansion of the piston 48 rotates the cog 74 causing the generator to generate electrical energy for recharging the battery.

[0072] The hydraulic circuit also includes an access point 80 for accessing the hydraulic system. The access point is provided between the cylinder 46 and the first valve 60. The access point 80 includes a fill point 82, for adding more fluid to increase pressure in the system and a bleed off valve 84, for removing fluid, and therefore pressure, from the system. The access point 80 therefore provides pressure adjustment means for increasing and decreasing the pressure within the system.

[0073] Figs 6 to 9 show a second embodiment of the invention. Like features are given like reference numerals.

[0074] Rather than a cover member 32, a platform member 90 is provided above the bladder member 26. The platform member 90 is supported centrally by the bladder member 26 and at each end by rubber mounts 94. The platform member 90 defines the upper surface 34. The platform member 90 and bladder member 26 are arranged such that the upper surface 34 is vertically level with the road surface 114 in the absence of any load on the platform member 90, and so the upper surface 34 is at the first position.

[0075] To assist in this, a supporting frame 92 is provided. The supporting frame 92 also provides an inclined surface 96 at each of the front and rear of the trough 28.

[0076] As an alternative to the bladder member 26, the platform member 90 could be centrally supported by a compression spring which biases the upper surface 34 of the platform member 90 towards the first position.

[0077] Fig 8 shows a hydraulic circuit for this embodiment. It is similar to Fig 4 in its construction and arrangement, except that the first valve 60 is normally closed.

[0078] Since the first valve 60 is closed, fluid within a bladder member 26 cannot escape out into the hydraulic circuit when a vehicle 100 drives over the upper surface 34. Therefore, the inflated bladder member 26 supports the platform member 90 which supports the vehicle 100, and the vehicle 100 can pass over the obstructing member 20 substantially unimpeded. This is in the absence of the first signal 14 as the vehicle 100 is travelling at or below the speed limit.

[0079] If the vehicle 100 is travelling above the speed limit, the first signal 14 will be transmitted by the speed camera 10 to the obstructing member 20 and the first valve 60 opens prior to the vehicle 100 reaching the obstructing member 20. In such case, fluid within each bladder member 26 is free to escape and pass the first valve 60 to act upon the piston head 50 when the upper surface 34 is contacted by the vehicle 100. Thus the bladder member 26 deflates and the upper surface 34 moves towards the second position in which the upper surface 34 is vertically spaced from the road surface 114 by a

certain distance 120. This is shown in Fig 7.

[0080] The rubber mounts 94 are arranged so that they allow the platform member 90 to pivot about the front mount (the first mount encountered by the vehicle 100). This forms a lip or step 98 in the vicinity of the rear mount. If the vehicle 100 exerts an excessive load on the platform member 90, the platform member 90 will come to rest on the front inclined surface 96 and the rear inclined surface 96 will provide the step 98.

[0081] The obstructing member 20 again effectively provides a rigid speed bump to the speeding driver, although the term "speed trough" may be more appropriate. Again, the driver experiences a degree of discomfort and, to avoid future discomfort, the driver is likely to conform to the speed limit when next travelling along the road 110.

[0082] If an override signal 16 is received, the control means 70 does not open the first valve 60 even if the first signal 14 has been received.

[0083] Fig. 9 shows an alternative arrangement for the valve means and is similar to Fig 5 except that the first valve 60 is normally closed and the second valve 62 is normally open. The second valve 62 is closed in response to receiving an override signal 16.

[0084] The present invention provides speed bumps which are dynamic and may be selectively deployed. Conveniently, they can differentiate between drivers who are observing the speed limit and those who are not. Emergency vehicles do not need to reduce speed to travel across the speed bump if they are provided with means for transmitting the override signal.

[0085] The size and shape of the speed bump can be readily altered by changing only the geometry of the bladder member 26. This can be done by replacing only the bladder member 26 or, to some extent, by altering the pressure within the system.

[0086] It is possible to provide a number of speed bumps according to the invention which are associated with a single roadside member. These speed bumps could be constructed so-as to actively contribute to reducing the speed of a vehicle when the driver does not do so voluntarily or if the driver is unable to sufficiently reduce speed in time.

[0087] Various modifications and improvements can be made without departing from the scope of the present invention.

Claims

1. A vehicle speed reducing device, comprising:

a roadside member provided at or adjacent to a first location along a path, the roadside member being adapted to selectively provide a first signal corresponding to a status of the roadside member;
an obstructing member provided at a second lo-

cation along the path, the obstructing member having an upper surface, wherein the upper surface of the obstructing member is movable between a first position in which the upper surface is substantially vertically level with the path surface and a second position in which the upper surface is vertically spaced from the path surface; and control means adapted to receive the first signal and responsively co-operate with the obstructing member so that the upper surface of the obstructing member is movable towards either the first or the second position when contacted by a vehicle.

2. A device as claimed in Claim 1, wherein the roadside member is adapted to selectively provide the first signal to a plurality of obstructing members.

3. A device as claimed in Claim 1 or 2, wherein the roadside member comprises a sensor adapted to detect the speed of a vehicle travelling along the path surface, and to provide the first signal when the detected speed is above a predetermined value.

4. A device as claimed in Claim 1 or 2, wherein the roadside member comprises an indicator member.

5. A device as claimed in any preceding claim, including transmitting and receiving means for broadcasting the first signal from the sensor to the control means.

6. A device as claimed in any preceding claim, including indicating means adapted to indicate one or both of the presence of the obstructing member and the position of the upper surface.

7. A device as claimed in any preceding claim, wherein the upper surface of the obstructing member is at the second position and is movable towards the first position when contacted by a vehicle.

8. A device as claimed in Claim 7, wherein the obstructing member comprises a bladder member provided at the second location.

9. A device as claimed in Claim 8, wherein the bladder member contains a hydraulic fluid.

10. A device as claimed in Claim 8 or 9, wherein the obstructing member includes a cylinder in fluid communication via one or more conduits with the bladder member.

11. A device as claimed in Claim 10, wherein the cylinder includes a piston having a piston head arranged such that pressure within the bladder member acts in a first direction upon the piston head.

12. A device as claimed in Claim 11, wherein the cylinder includes biasing means for biasing the piston head towards the opposite direction.
13. A device as claimed in any of Claims 10 to 12, wherein the obstructing member includes valve means interposing the bladder member and the cylinder.
14. A device as claimed in Claim 13, wherein the valve means has an open and a closed position and is controllable using the control means.
15. A device as claimed in Claim 14, wherein the valve means comprises a first valve which is normally open and the control means is adapted to close the first valve in response to receiving the first signal.
16. A device as claimed in Claim 15, wherein the control means is adapted to receive an override signal and does not close the first valve in response to receiving both the first signal and the override signal.
17. A device as claimed in Claim 15, wherein the valve means further comprises a second valve which is fluidly arranged in parallel with the first valve and which is normally closed, and wherein the control means is adapted to open the second valve in response to receiving at least an override signal.
18. A device as claimed in Claim 16 or 17, wherein the control means includes timing means such that the control means does not close the first valve or the control means opens the second valve in response to receiving the first signal.
19. A device as claimed in any preceding claim, including power supply means for at least the control means.
20. A device as claimed in Claim 19 when dependent on Claim 11 or 12, wherein the device is adapted to convert retraction and/or expansion of the piston to electrical energy.
21. A device as claimed in Claim 20, wherein the piston includes an external extending portion including a plurality of linear teeth.
22. A device as claimed in Claim 21, wherein the power supply means includes a generator member including a cog member having rotational teeth adapted to mate with the linear teeth such that retraction and/or expansion of the piston rotates the cog member to generate electrical energy.
23. A device as claimed in any of Claims 10 to 18, including pressure adjustment means for one or both of increasing and decreasing the pressure within the system.
24. A device as claimed in any of Claims 1 to 6, wherein the obstructing member is movable towards the second position when contacted by a vehicle.
25. A device as claimed in Claim 24, wherein the obstructing member comprises a bladder member containing a fluid, and wherein the obstructing member includes a platform member which defines the upper surface, the platform member being supported by the bladder member.
26. A device as claimed in Claim 25, wherein the obstructing member includes a cylinder in fluid communication via one or more conduits with the bladder member, the cylinder including a piston having a piston head arranged such that pressure within the or each bladder member acts in a first direction upon the piston head, the cylinder further including biasing means for biasing the piston head towards the opposite direction.
27. A device as claimed in Claim 26, wherein the obstructing member includes valve means interposing the bladder member and the cylinder, the valve means having an open and a closed position and being controllable using the control means.
28. A device as claimed in Claim 27, wherein the valve means comprises a first valve which is normally closed and the control means is adapted to open the first valve in response to receiving the first signal.
29. A device as claimed in any of Claims 24 to 28, wherein the device is adapted to convert retraction and/or expansion of the piston to electrical energy.
30. A vehicle speed reducing device, comprising:
an obstructing member having an upper surface,
wherein the upper surface of the obstructing member is movable between a first position in which the upper surface is substantially vertically level with the path surface and a second position in which the upper surface is vertically spaced from the path surface; and
power generating means adapted to convert movement of the upper surface of the obstructing member to electrical energy.
31. A device as claimed in Claim 30, including control means for moving the upper surface of the obstructing member towards either the first or the second position.
32. A device as claimed in Claim 31, including power supply means for supplying power to at least the control means, wherein the power supply means re-

ceives electrical energy from the power generating means.

33. A device as claimed in Claim 32, wherein the power supply means comprises a rechargeable battery. 5
34. A device as claimed in any of Claims 30 to 33, wherein the obstructing member comprises a bladder member and a cylinder in fluid communication via one or more conduits with the bladder member, 10 wherein the cylinder includes a piston having a piston head arranged such that pressure within the bladder member acts in a first direction upon the piston head.
35. A device as claimed in Claim 34, wherein the cylinder 15 includes biasing means for biasing the piston head towards the opposite direction.
36. A device as claimed in Claim 34 or 35, wherein the piston includes an external extending portion including a plurality of linear teeth. 20
37. A device as claimed in Claim 36, wherein power generating means comprises a generator member including a cog member, the cog member comprising 25 rotational teeth adapted to mate with the linear teeth such that retraction and/or expansion of the piston rotates the cog member to generate electrical energy. 30

30

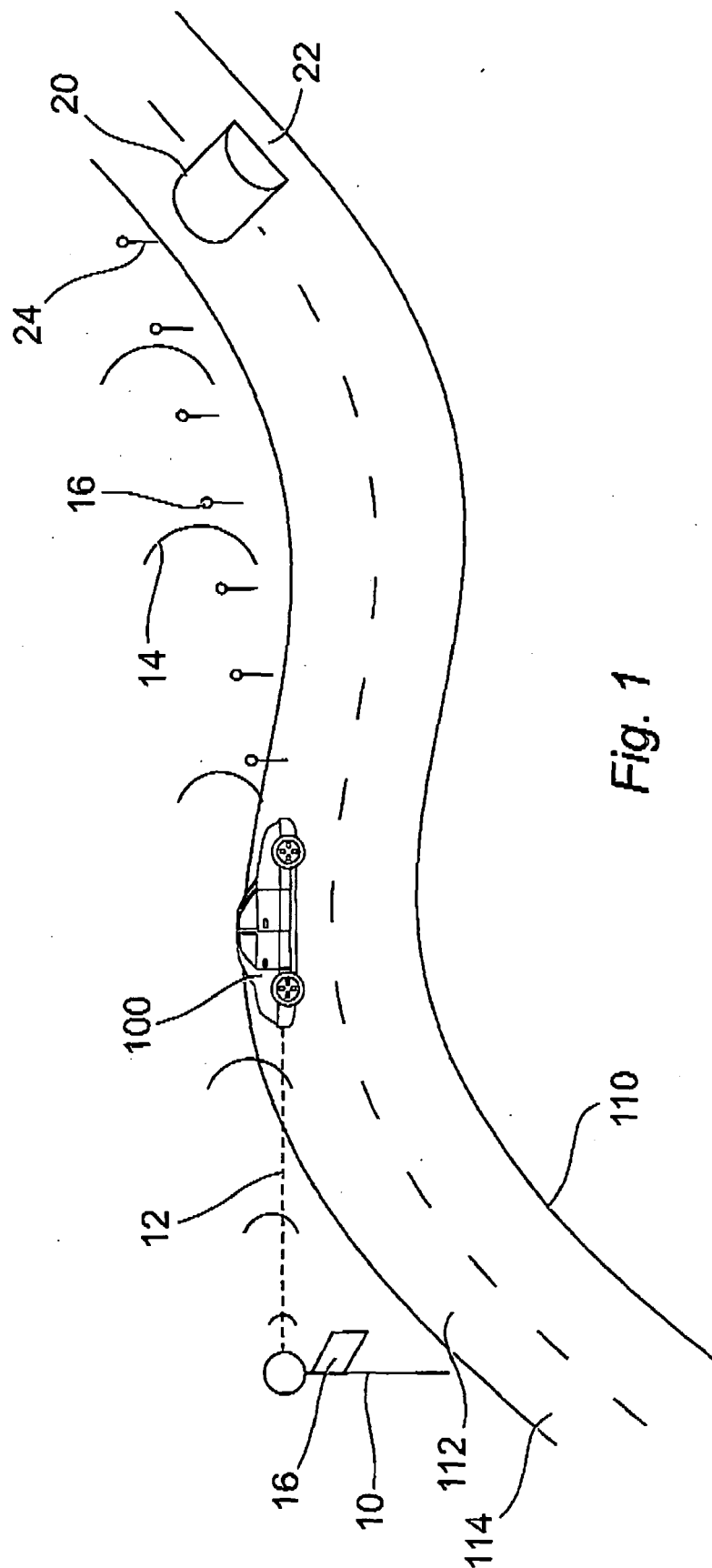
35

40

45

50

55



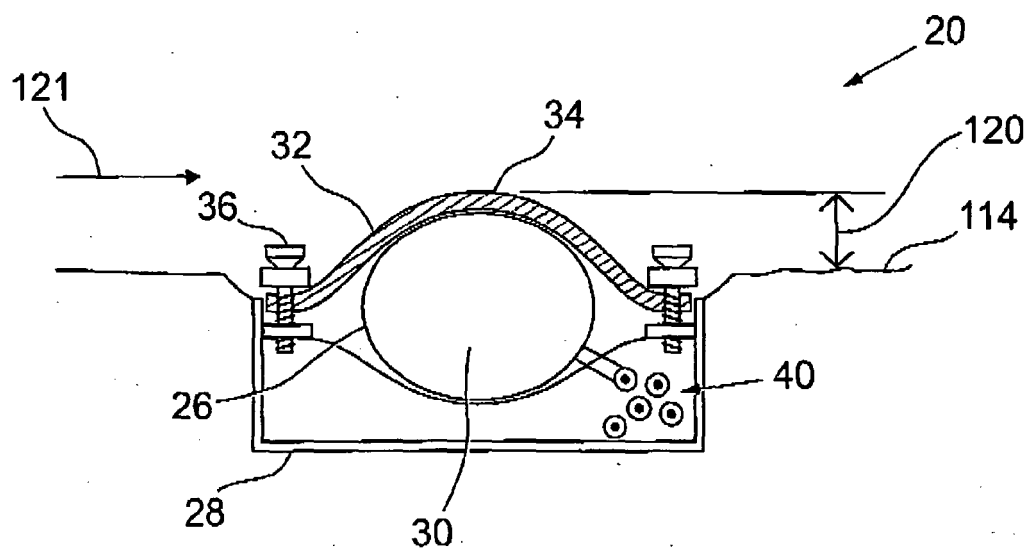


Fig. 2

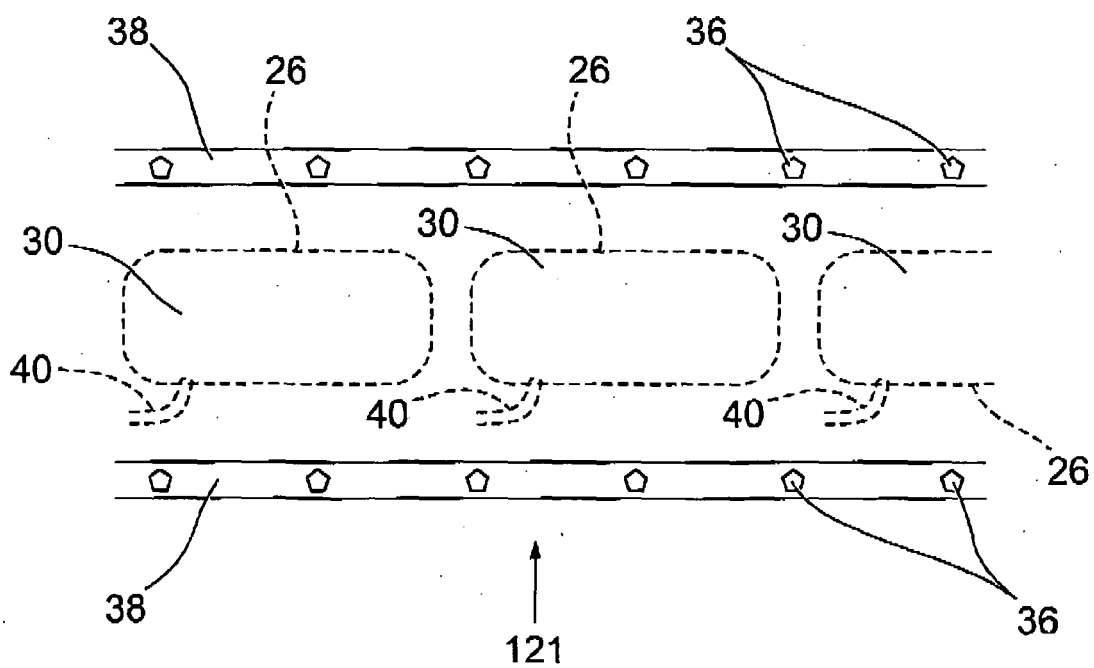


Fig. 3

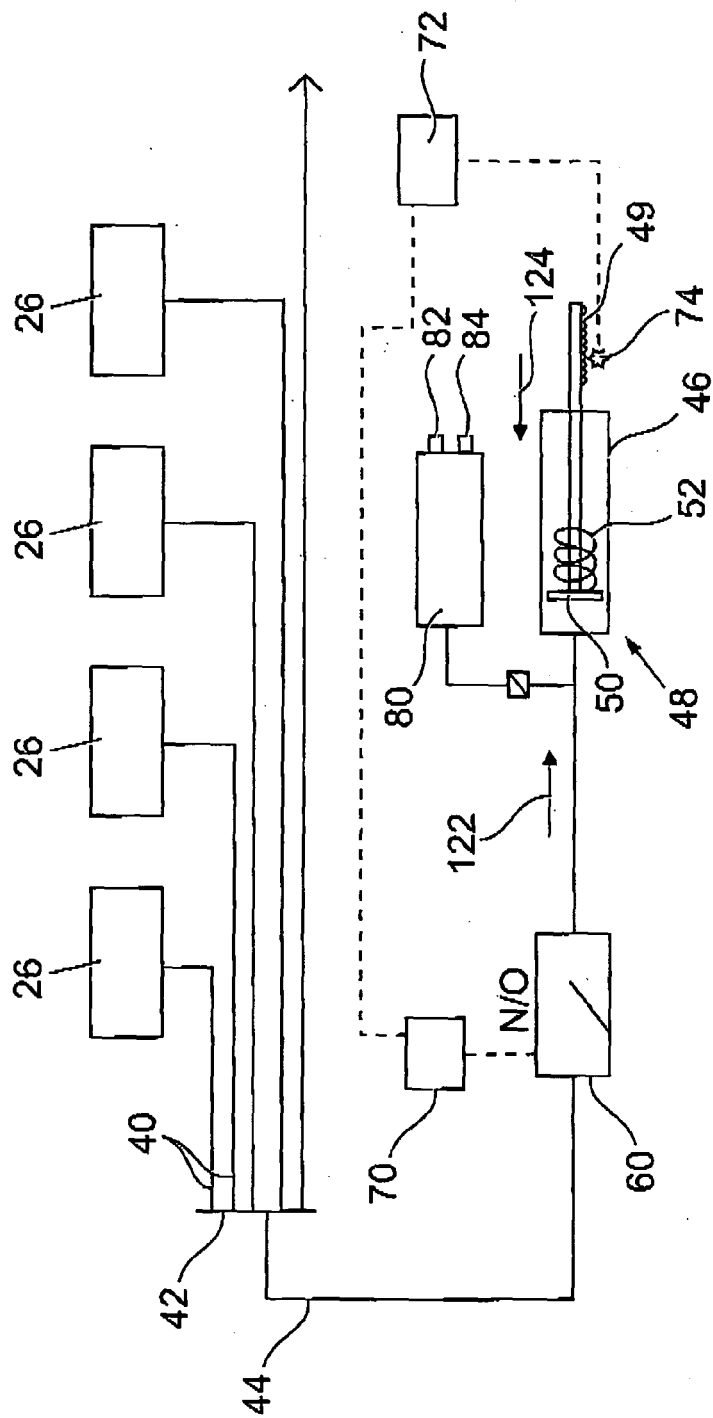


Fig. 4

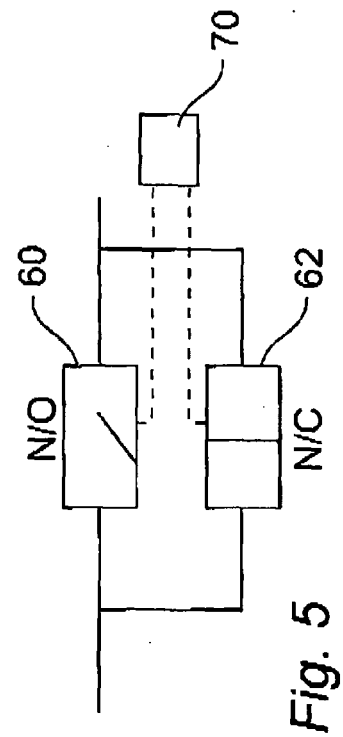


Fig. 5

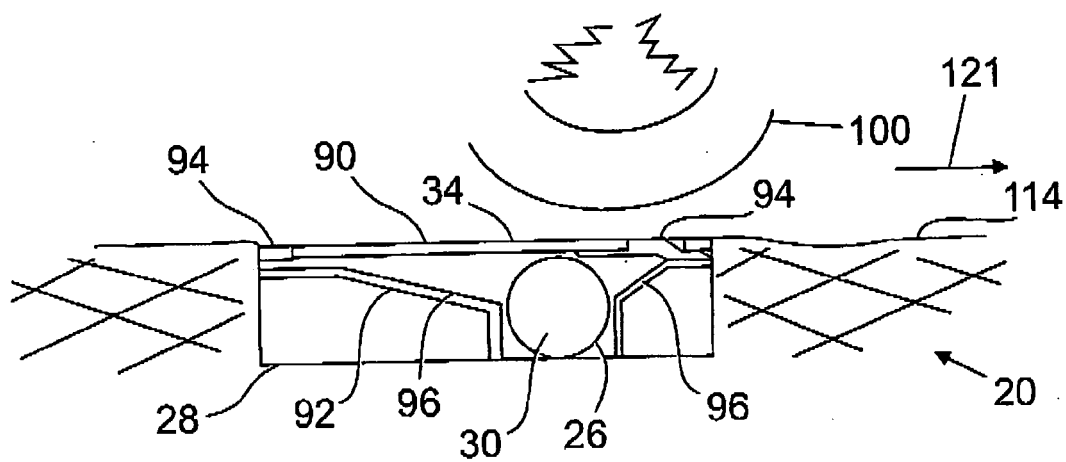


Fig. 6

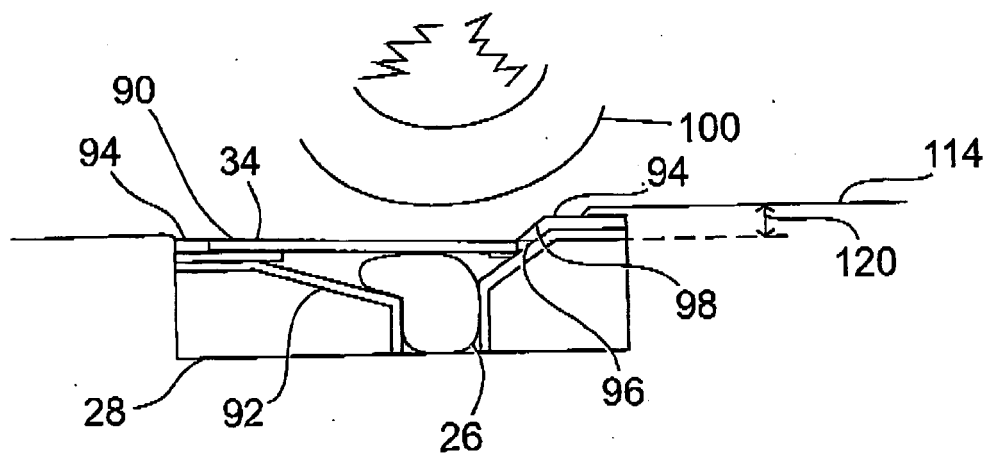


Fig. 7

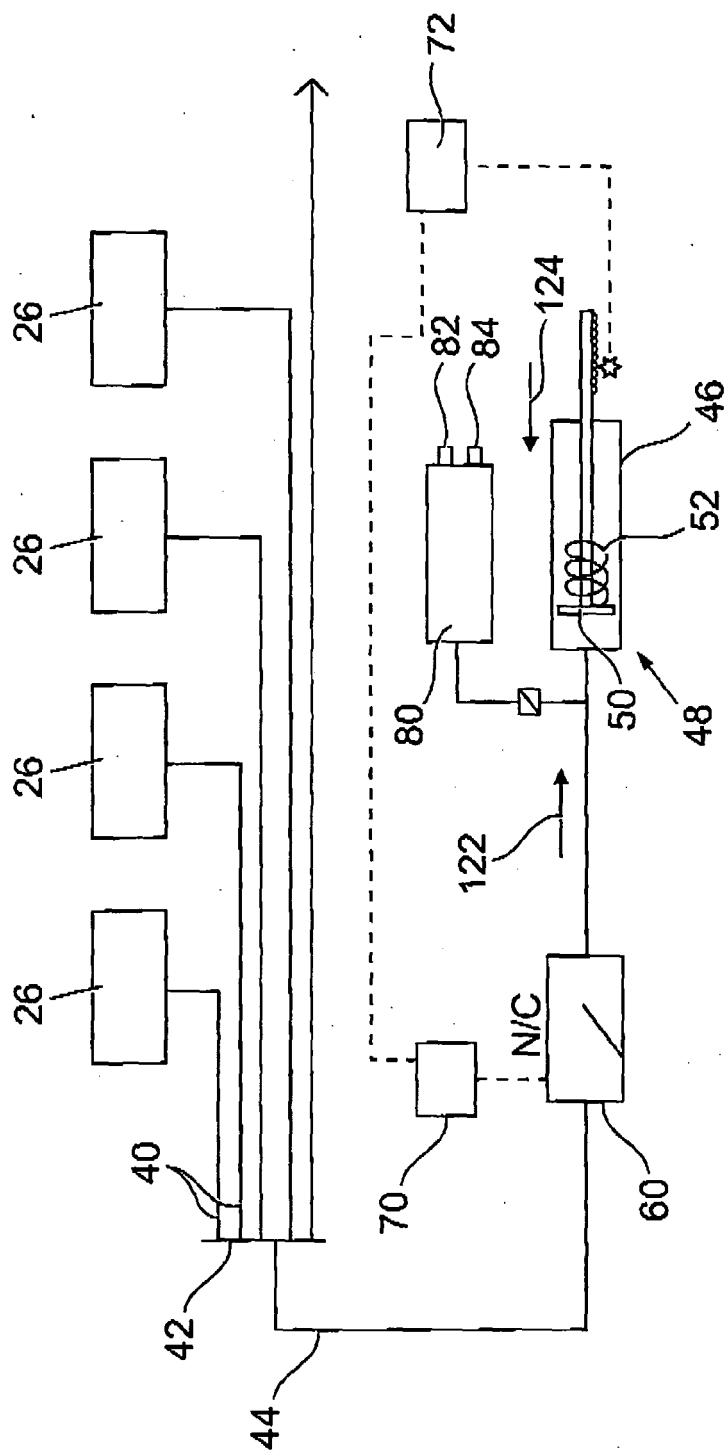


Fig. 8

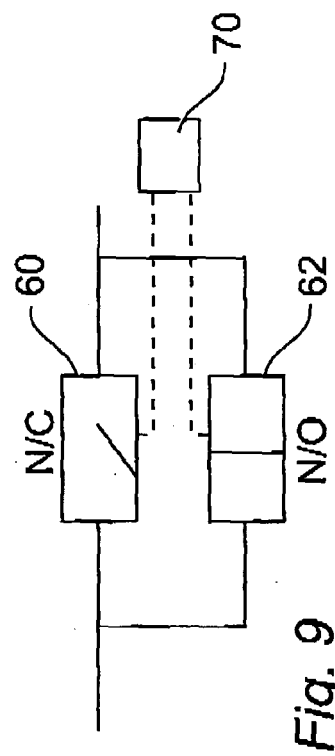


Fig. 9