Patents Act 1977 **Opinion Number** **12/24**

OPINION UNDER SECTION 74A

Patent	GB 2482797
Proprietor(s)	Goodnature Limited
Exclusive Licensee	
Requester	Reddie & Grose LLP
Observer(s)	Withers & Rogers LLP *on behalf of Goodnature Limited*
Date Opinion issued	Click here to enter a date.

The request

1. The comptroller has been requested to issue an opinion as to whether the patent is invalid in the light of prior art document WO 85/03201 A1, published 1st August 1985, on the basis of novelty and inventive step.

2. The Patent was filed via the PCT international route on 3rd March 2010 with a priority date of 4th March 2009. It was granted on 12 June 2013.

Observations

3. Observations were received on behalf of the proprietor refuting the assertion of lack of novelty and inventive step put forward in the request. They make no detailed comment as to how the claims of the patent should be construed. They do however argue that there are reasons to refuse the request under Section 74, which I address below. There are also observations in reply which focus on how the requester has construed the 'diaphragm' feature of claim 1 broadly.

Matters to be considered by this Opinion

4. Section 74A(3) of the Patents Act 1977 states:

> *The comptroller shall issue an opinion if requested to do so under subsection (1) above, but shall not do so –*
>
> *(a) in such circumstances as may be prescribed, or*
> *(b) if for any reason he considers it inappropriate in all the circumstances to do so.*

with the relevant part of the rules stating:

> *94. (1) The comptroller shall not issue an opinion if—*
>
> *(a) the request appears to him to be frivolous or vexatious; or*
> *(b) the question upon which the opinion is sought appears to him to have been sufficiently considered in any relevant proceedings.*

5. The observer notes the similarity of the prior art raised in the request to two other documents which were cited during pre-grant proceedings in the Office. They also note that these three documents share the same applicant. On that basis, they argue that the request is not making a new case and that I should thus refuse the request under Section 74(A) (and rule 94(1)b). I disagree. The request focusses on the description and figures of actuation valves that do not feature in the pre-grant citations and therefore a new argument is presented.

6. The Observations also argue that the request does not present a sufficient argument regarding lack of inventive step against claim 1. This seems to be addressed at point 4.5 at the end of the request where it states that if I found claim 1 was novel '*the distinctions over document D1 would be so trivial such that the claims could not be considered to involve an inventive step'*. I agree that this is not fully argued as there is no indication of what 'the distinctions' might be. Thus I will not give an opinion on whether claim 1 has an inventive step over D1 (point 4.5). However this is not a reason for me to refuse to deal with other parts of the request.

7. Therefore, I will address the novelty arguments of points numbered 3.1 to 3.12 directed to claim 1 and some of the dependant claims. I will not address point 4.5 regarding inventive step against claim 1 but I will address the inventive step arguments of points 4.1 to 4.4 against some of the dependant claims if I find claim 1 lacks novelty.

8. For completeness I note that I will take into account the observations in reply. I do not consider them to be making any additional arguments, rather they merely expand on why they have construed the claim broadly.

The Patent

9. The invention is an animal trap for killing a range of pest animals, which may range broadly in size from a rat to a beaver. The trap mechanism is potentially able to release and reset itself automatically. The trap uses compressed gas to drive the kill mechanism.

10. To illustrate the invention I have selected one of the embodiments of the invention shown in the following figures (where I have partly edited out some of the parts and labels to aid clarity). Figure 2 is a cross-section with, at the right side, a trap housing 14 with a space 32 to receive an animal and a hammer 23 attached to a central piston 22 that moves powerfully rightwards. The piston is driven by compressed gas released into the central inner cylinder 18 to push against the piston seal 26 within. The trap is shown in its ready open state with the piston biased leftwards by spring 29. Lying against the end of the central inner cylinder is a diaphragm 10 to provide a seal between its surface 45 and the end of central cylinder walls 16. The diaphragm

10 is held at its perimeter and is able to flex to move its central portion leftwards to break the seal and provide a passage between the inner cylinder 18 and the outer coaxial surrounding reservoir 17. The outer reservoir 17 is filled with high pressure gas in the ready state such that movement of the diaphragm 10 causes the kill mechanism to move.

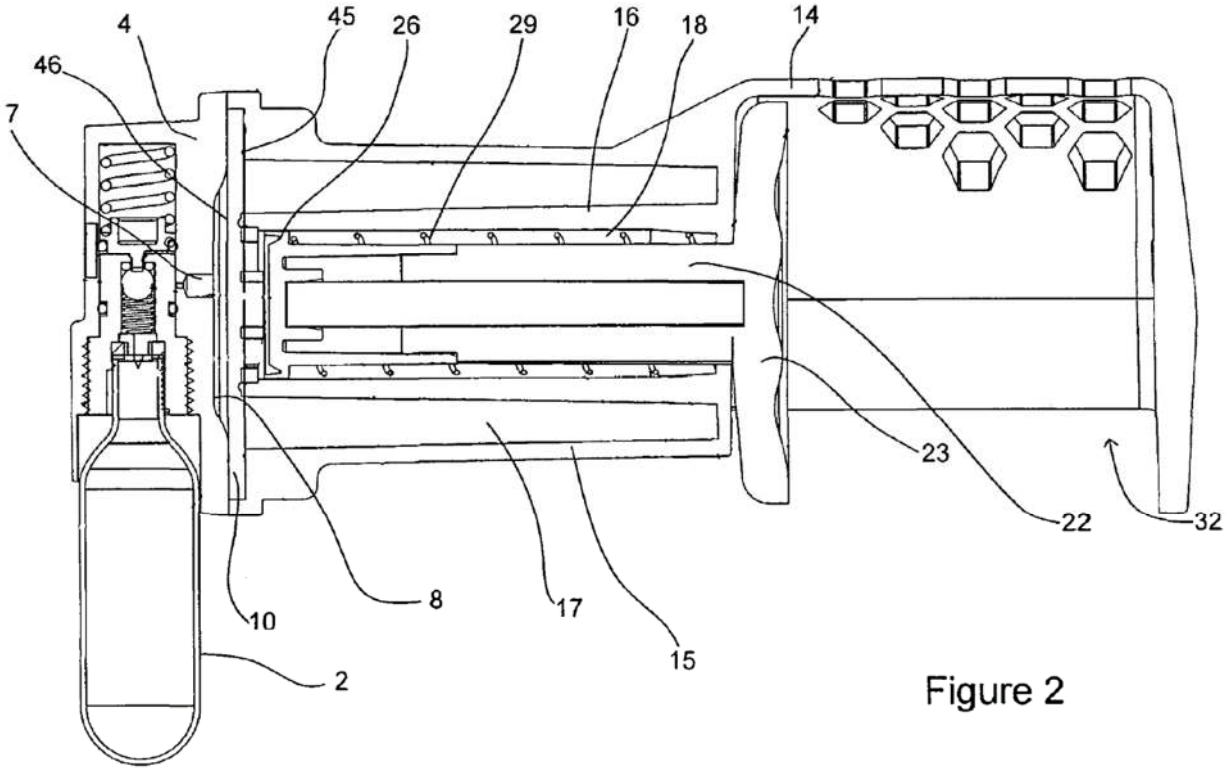


Figure 2

11. The piston cylinder and annular reservoir are defined by inner wall 16 and outer wall 15 of the housing 14. The housing 14 is fixed to a regulator housing 4 (at the left) with the diaphragm 10 held between with rear surface 46 facing a space 8 at the front of the regulator. Pressurised gas from bottle 2 flows through path 7 into region 8 between the regulator body and diaphragm 10; When the trap is in the ready state, the pressure in 8 keeps the diaphragm pushed rightwards to seal onto the housing.

12. Figure 1 is an exploded diagram of this embodiment revealing part of the trigger system not shown in figure 2. End of piston 25 faces the front 45 of the diaphragm 10. A groove 36 is formed on the regulator 4 so that a gas path from region 8 behind the diaphragm is formed, via a hole 37 through the diaphragm, to the trigger pipe 39 capped by a trigger valve 40. When assembled, the trigger pipe 39 has an end at cover region 42 so the valve emerges through the housing 14. The trigger valve is normally biased closed and can be activated from outside of the trap housing to open and release some pressure from behind the diaphragm to the ambient air. If this valve opens when the reservoir 17 is pressurised, then the diaphragm will move leftwards due to the relatively reduced back pressure and trigger the trap. If the trigger valve is then closed, the pressure behind diaphragm can build again and it

will move back into the sealed position against the reservoir and piston.

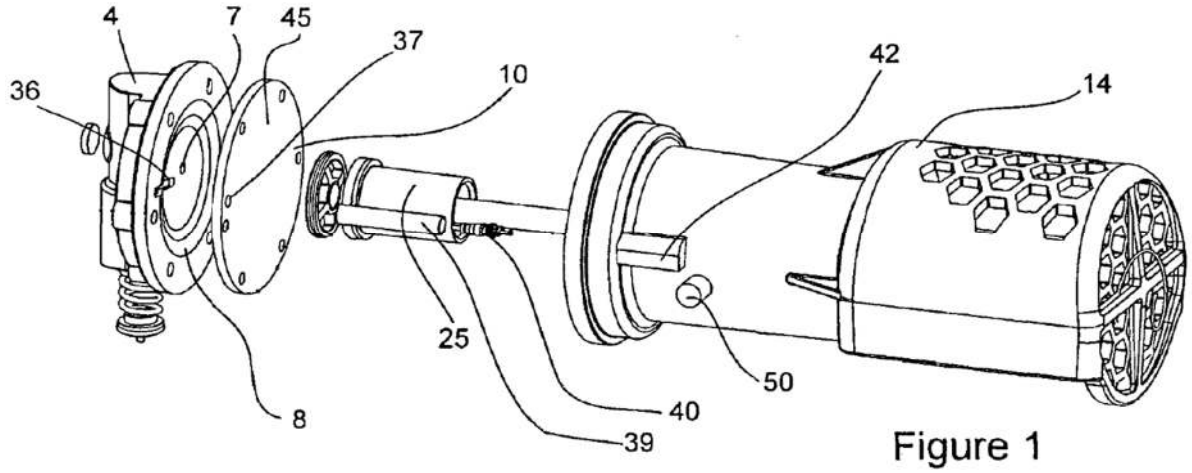


Figure 1

13. Figure 3 shows the outside of the assembled trap housing 14 with the valve end 40 external. Figure 4 shows the front of the diaphragm and a second groove 44 (not shown in the previous figures) arranged to connect the through hole 37 to the reservoir 17. Thus a gas path from the regulator front region 8 and port 7 is provided to this outer annular reservoir such that, with the trigger valve closed, the reservoir will be charged with pressurised gas. When the reservoir is filled and the trigger valve is closed, the pressure on the rear 46 will tend to remain higher that the front 45, so that the diaphragm will sit in the sealed, ready position. The change in pressure at either side of the diaphragm, when it is held at an edge, causes it to flex to provide motion of the central portion from the sealed state to the triggered state where the reservoir is connected to the piston cylinder.

Figure 4

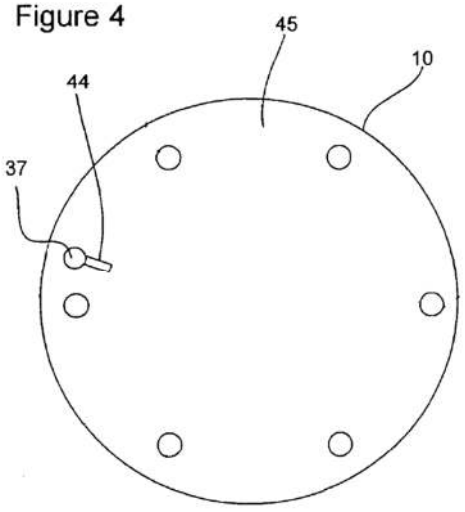
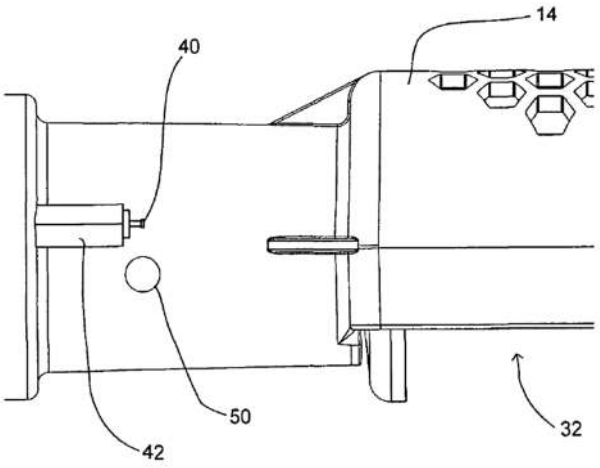


Figure 3



14. Two alternate trigger mechanisms are described in the various embodiments for how an animal, once it has entered the trap space 32, will cause the trigger valve to be

opened by depressing end 40. A first mechanism uses a pivoting of the whole trap housing 14 (at pivot 50 in figures 1,3) on a trap mount (not shown) to cause the valve end to contact a stop on the mount (not shown). The pivoting is caused by the shifting weight of the animal on the trap housing. A second mechanism (also not shown here) has a lever mechanism within the space 32 which is nudged by the animal to transmit a force onto the valve end. The description lists alternative triggers, such as a 'biter' or 'electronic or optical sensor actuator'.

15. While each embodiment shows a gas driven piston hammer, the description lists other kill means, such as a spike or a cutting element, that may be driven by the piston.

Claim Construction

16. As a first step in determining the validity of the patent I must correctly construe the claims. This means interpreting them in the light of the description and drawings as instructed by Section 125(1). In doing so I must interpret the claims in context through the eyes of the person skilled in the art. Ultimately the question is what the person skilled in the art would have understood the patentee to be using the language of the claims to mean. This approach has been confirmed in the decisions of the High Court in *Mylan v Yeda*[1] and the Court of Appeal in *Actavis v ICOS*[2].

17. Section 125(1) of the Act states that:

> *For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.*

18. And the Protocol on the Interpretation of Article 69 of the EPC (which corresponds to section 125(1)) states that:

> *Article 69 should not be interpreted in the sense that the extent of the protection conferred by a European patent is to be understood as that defined by the strict, literal meaning of the wording used in the claims, the description and drawings being employed only for the purpose of resolving an ambiguity found in the claims. Neither should it be interpreted in the sense that the claims serve only as a guideline and that the actual protection conferred may extend to what, from a consideration of the description and drawings by a person skilled in the art, the patentee has contemplated. On the contrary, it is to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties.*

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[1] *Generics UK Ltd (t/a Mylan) v Yeda Research and Dev. Co. Ltd & Anor* [2017] EWHC 2629 (Pat)
[2] *Actavis Group & Ors v ICOS Corp & Eli Lilly & Co.* [2017] EWCA Civ 1671

19. The claims comprise a single independent claim 1 and dependant claims 2 to16. Claim 1 reads:

> *1. A trap including:*
>
> *i. a source of compressed gas;*
> *ii. a trigger mechanism configured to be actuated by an animal;*
> *iii. a kill mechanism powered by the compressed gas; and*
> *iv. a diaphragm that in a ready state blocks flow of the compressed gas to the kill mechanism;*
>
> *wherein, in use, when the trigger mechanism is actuated by an animal, the diaphragm moves so as to allow gas to flow to actuate the kill mechanism to kill the animal.*

20. The claims are considerably broader than the embodiments and consequently the scope of the various features need to be considered carefully. The construction of features *i. ii.* and *iii.* in the claim is not disputed by the parties, but there is a major difference in construing the rest of the claim.

21. The request construes '*A trap ...*' to be a device for killing pests. I think that is a reasonable interpretation given that the claim then talks about killing an animal. The claim does not specify any size of animal, but I think that, given page 1 and page 22 of the description, the trap would be sized for the target pest and it is implicit that this can range from mice to possum or foxes for example. I think that the normal meaning of trap implies that the device will capture and restrain the animal, but this action is not explicit in the claim as it only describes a kill mechanism. The preferred embodiments have the kill mechanism holding the animal for a period before the trap automatically release the animal and resets. I also note that the embodiments show a chamber with an entrance that the animal must pass through to reach the trigger and kill mechanism. Because the claim does not require a trap chamber, nor does it require that an animal is captured and held, the term 'trap' should be construed broadly and the invention does not require these features.

22. There are no major constructional issues with feature *i.* or *iii.* I note that the description says that the type of trigger and type of kill mechanism can be selected for a specific pest animal on the basis of its behaviour, size and physiology. The request notes that 'compressed gas' can include compressed air, which I think is correct. As the type of kill mechanism is not specified, this should be construed broadly, but I think it is implied that it kills the animal by a mechanical method with the required work to energise the kill mechanism provided by the pressure of the compressed gas. Thus I do not think the claim encompasses electrocution for example.

23. Looking at the embodiment, the force activating the kill mechanism is provided by an air piston driven by a valve operated by the trigger. I note that as well as the animal moving a mechanical means for the trigger as the embodiments show, the description says that an optical or electronic trigger can be used. As none of these features are specifically required by the claim, I think it should be construed as not requiring an actuating piston, nor needing a purely mechanical trigger. I shall discuss the valve aspect below.

24. I find feature *iv.* and the final clause to be problematic. Because hardly any details of the kill mechanism or trigger are given, it is difficult to understand how the diaphragm operates. The request does not discuss this directly, but instead highlights features of the prior art and asserts that these disclose the diaphragm and its operation. The observations from the proprietor also do not discuss this directly, with one section essentially indicating where in the first embodiment the features of the claim are found. The observations do note that, in the prior art, the primary path of compressed air is through a valve with a valve element moving away from a valve seat, neither of which are a diaphragm.

25. The observations in reply do provide more detail on construction. They argue that, as the claim does not say that the diaphragm itself is providing 'a physical barrier' to the flow of gas to the kill mechanism, then the diaphragm should be construed broadly. They consider that while the diaphragm needs to move and somehow cause the gas to flow, the diaphragm itself does not need to provide a seal that blocks the gas. They also note that for a seal to be made by the diaphragm the trap needs to have somewhere for that seal to be formed against, but nothing is said in the claim about what this might be.

26. In the patent I see the support provided by the embodiments is for a diaphragm to be part of a valve and for it to act as a moving valve element that seals to a 'valve seat' element (providing the effect of feature *iv.* in claim 1) and for it to move away from the valve seat, by flexing to provide the effect of the final clause of claim 1. In particular, the embodiments all show the diaphragm as resting on or flexing away from the entrance to the driving piston cylinder (walls 16).

27. I think that the claim at least implies that the diaphragm provides a valve effect, as flow is blocked and then allowed to flow. This is despite claim 1 not explicitly saying the diaphragm is part of a valve, nor that it specifically provides a seal blocking a passageway. Thus I think feature *iv.* implies a valve is needed.

28. Looking at the description of the patent, the only disclosure in embodiments is where the diaphragm is flexible and directly acts as a moving valve element to seal against the entrance port of a piston actuator. There is very little said in the patent about how a diaphragm might otherwise move. Nor is there anything in the patent about a diaphragm being positioned anywhere else. The embodiments only show a piston actuator being used with the kill mechanism. It is not clear that any alternative actuators are envisaged for the noose kill mechanisms discussed in pages 20 to 21.

29. Thus, I construe the claim as implying the diaphragm is part of a valve and given the support available, that it is implied to specifically act to provide a seal element of a valve, moving on and off a valve seat. I think that '*a diaphragm that in a ready state blocks flow of the compressed gas to the kill mechanism'* should be read as requiring a valve in the direct path of the gas to the mechanism and with the gas directly blocked by the diaphragm when the valve is closed and subsequently the gas passes around the diaphragm when the valve is open.

30. It is less clear if I should imply that the movement is limited to a flexing of a resilient diaphragm, or if the claim should be read broadly to allow another type of movement and not require flexing. The request does not address this issue. The meaning of 'diaphragm' in general does not always imply flexibility. The claim language makes

no hint of the diaphragm flexing. Because the claim has so little detail of the implied valve features, it is difficult to construe ‘diaphragm’ narrowly.

31. Despite the embodiment only showing a flexing diaphragm, I am construing this feature more broadly to allow any motion that causes the diaphragm to move on and off some kind of valve seat, port or equivalent element. I am also construing the diaphragm itself broadly; The claim does not imply that it is resilient and flexible.

The prior art WO 85/03291 A1

32. This patent document shows a rodent exterminating device that has a trap with a pneumatically actuated kill mechanism and is able to subsequently automatically release the rodent and reset itself. A side cross-section is shown in figure 1. At the upper left, a connector 44 for a compressed air supply leads to an accumulator chamber 40. In the middle, a pneumatic valve control module 64 connects the accumulator to the kill actuator piston 24 on the lower left. The rodent trap is in the lower right, with trigger plate 70 pressed by the rodent to move the trigger mechanism linked to the control module 64 by vertical rod 76.

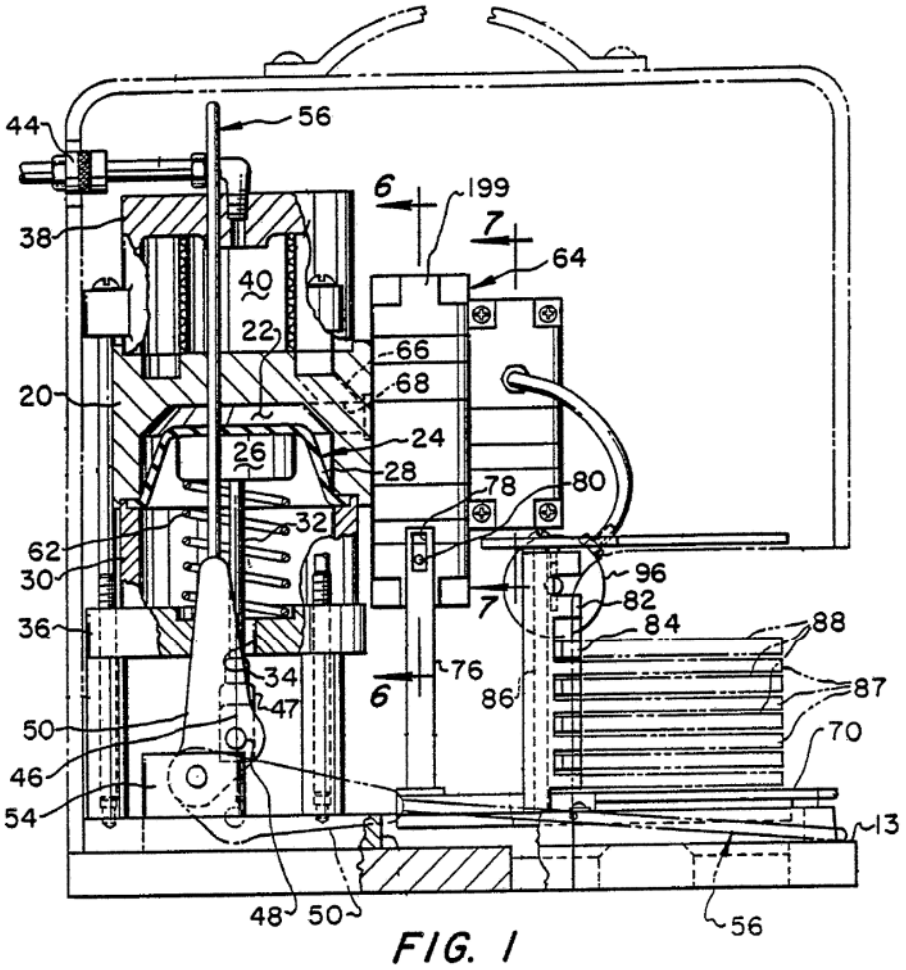


FIG. 1

33. The kill actuator piston 24 comprises a cylinder 20 with a cavity 22 above a piston assembly (26,28,32) that is driven vertically downwards against bias spring 62 to the

kill mechanism. The piston has flexible sealing diaphragm 24 (for the cavity 22) above the piston head 26 and connecting rod 32. The kill mechanism is a striking bar 56, show vertical in a ready state (on the left), connected to actuator crank arm 50. The bar rotates clockwise to swing down into the trap area towards the position shown in outline across the bottom of the device. Once the kill mechanism has triggered, an ejection system (including tines 87,88 that swing horizontally across the trap) operates with the trap being emptied by a second actuation piston 96 that is arranged horizontally with an axis perpendicular to the cross-section view of figure 1. The ejection mechanism is also controlled by the module 64.

34. Figure 5 below appears, as far as I understand it, to show the schematic circuit of the pneumatic directional control valve module 64 (using ISO 1219 symbols). The upper half showing two connected valves, each having two positions and three ports. This upper half is shown to drive the kill mechanism actuating piston 24 with pressurised air from input 66 (connected to accumulator chamber 40) passing into the cylinder cavity 22. The lower half of the module 64 has two valves controlling the ejection system actuator 96.

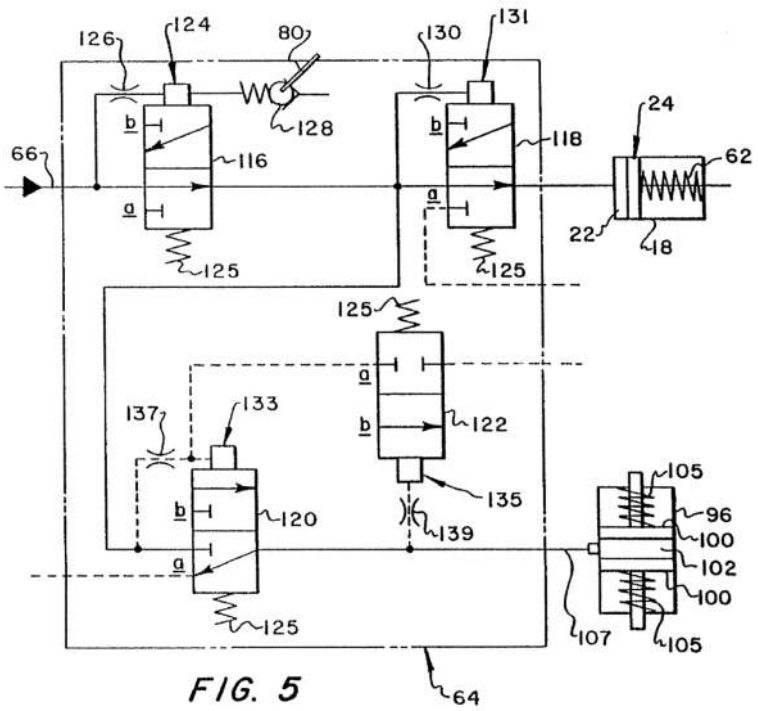


FIG. 5

35. I shall only describe the function of the kill mechanism valves here as they are the relevant part of the disclosure regarding the request and the patent. Each of these valves has a return spring 125 to bias the valve into an open position. Against this force, are pilot actuators 124 and 131 fed pressure via flow restrictors 126, 131 from the input. When pressure is provided at the input, the pilot actuator moves the valve to the closed position with the restrictor causing a time delay to the movement. When filled, the accumulator provides pressure to first valve 116 and the pilot 124 closes the valve. Thus the consequential low pressure at the input of downstream valve 118 means the pilot 131 allows it to move to the open position. This series connection (116 into 118) of closed and open valves is the ready state of the trap.

36. The first pilot actuator 124 is also connected to a trigger release valve 128 that links to the trap trigger mechanism. When the trigger operates, pressure drops at the pilot 124, which causes the first valve 116 to open. This then pressurises the second valve input and it's pilot 131, so that after a short delay, the second valve closes. During the delay period, the initially open second valve 118 allows the pressurised air from the accumulator to drive the kill mechanism piston.

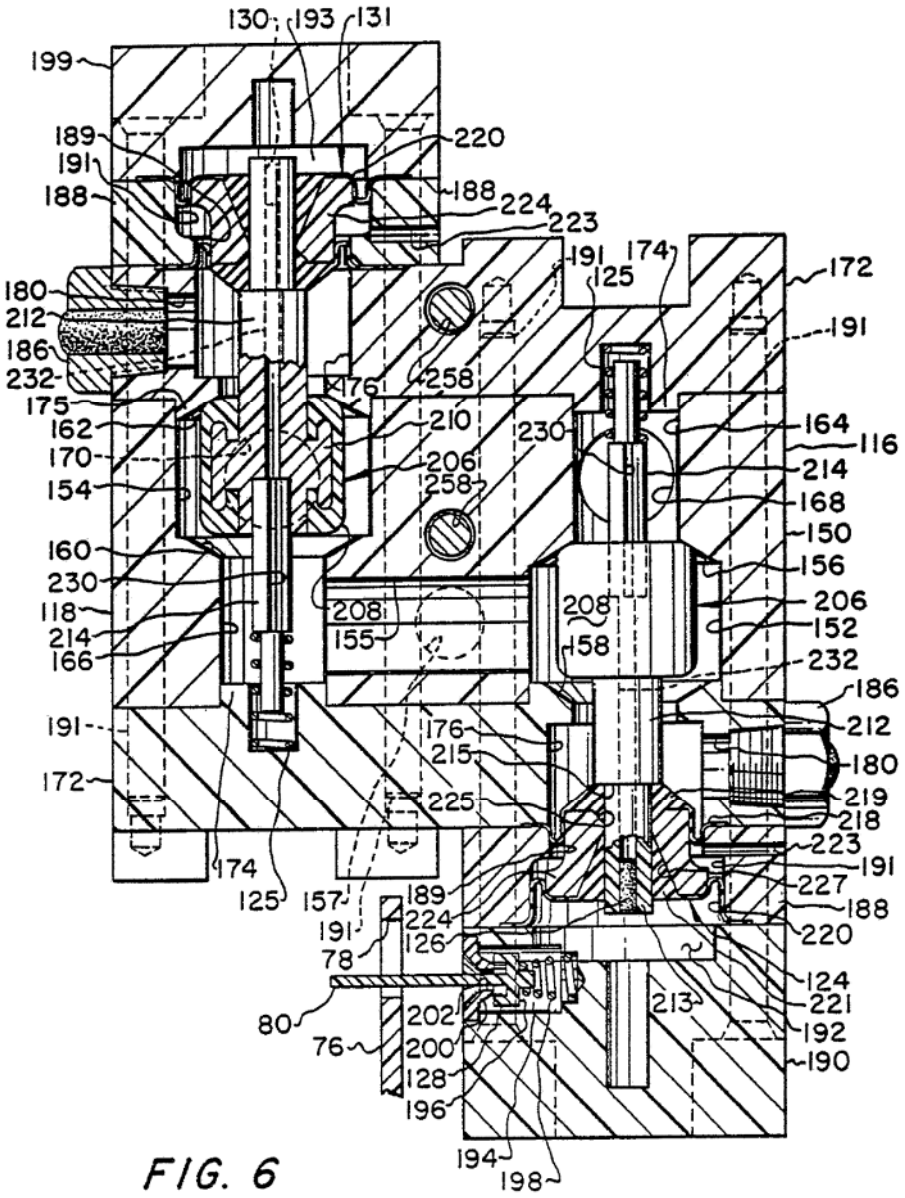


FIG. 6

37. The physical realisation of the kill mechanism valves 116, 118 in module 64 are shown in cross-section in figure 6 (at a perpendicular plane as arrows 6 show in figure 1) with the valves in the ready 'closed-open' positions. The valves move vertically in this figure, but compared to the schematic, are aligned right to left and with one flipped around. The first valve 116 is on the right and has the accumulator input port 168 at upper end entering perpendicular to the cross-section adjacent the bias spring 125. The main valve chamber 154 has a plug shaped valve element 206, 208 resting closed against upper valve seat 156. A central path leads from 154 to the left and to the second valve 118 chamber 154 and (also perpendicular) exit port 170

leading to the piston of the kill mechanism. The second valve is in the open position with the spool shaped valve element away from the lower valve seat 160.

38. At the bottom right and the top left are actuator chambers that each contain the pilot actuators which connect to the valve elements via connecting shafts. Opposing shafts are arranged from the valve elements to the bias springs. These chambers are each separated in to two regions by a central actuator piston body having a pair of flexible sealing diaphragms at the upper and lower sides. A first region is connected to the valve chamber, while the second region is instead connected to the pilot supply. The connecting shafts provide an axial passage 232 for the pilot pressure to pass from the valve input port side to the second regions of the actuator chambers.

39. The actuators work to oppose the bias springs when a pressure differential is formed in the two regions either side of the sealing diaphragms. Thus in the ready state shown, the lower right region 192 is pressurised higher than the valve region above it that is connected to the output port in the closed position. It can be seen how this lower region is connected to the trigger valve assembly (located at the bottom centre of the figure) with its end 80 fixed to the trigger mechanism arm 76. The trigger valve is biased closed and when opened acts to vent the lower region to atmosphere. The reduced pressure differential is such that the main valve bias spring will open the valve and move the valve element and the connected actuator piston downwards. This causes the upper region to have a higher pressure. The downwards motion flexes the two sealing diaphragms attached to the piston. When the trigger is released and the trigger valve closes, the pressure in the lower region 192 builds again to reduce the pressure differential and the bias spring acts to close the valve. The rate of filling of the chamber is restricted by the narrow bore through the connecting shafts.

40. Thus the pair of sealing diaphragms act to separate the actuator into the two regions and allow the pressure differential to build up that acts to drive the actuator piston against the bias spring to close the valve. It seems that the pressure differential is helped to create a net force to move the pilot actuators by having the two sides of the actuator piston (and thus also two diaphragms) be different sizes.

41. The delay in closing the second valve on the left is similarly due to the time it takes for the air to pass from the valve chamber (connected by the newly opened first valve) though the shafts to sufficiently pressurise the upper region 193 and drive the valve element down against the spring. As I explain above, the delay provides a pulse of air pressure to the kill mechanism piston.

The Law

42. Section 1(1) of the Act reads:

> *A patent may be granted only for an invention in respect of the following conditions are satisfied, that is to say –*
> *(a) the invention is new;*
> *(b) it involves an inventive step…*

Section 2(2) of the Patents Act 1977 states:

> *The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way.*

Section 3 of the Patents Act 1977 states:

> *An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).*

43. To determine whether or not an invention defined in a particular claim is inventive over the prior art, I will rely on the principles established in *Pozzoli SPA v BDMO SA [2007] EWCA Civ 588,* in which the well-known *Windsurfing* steps were reformulated:

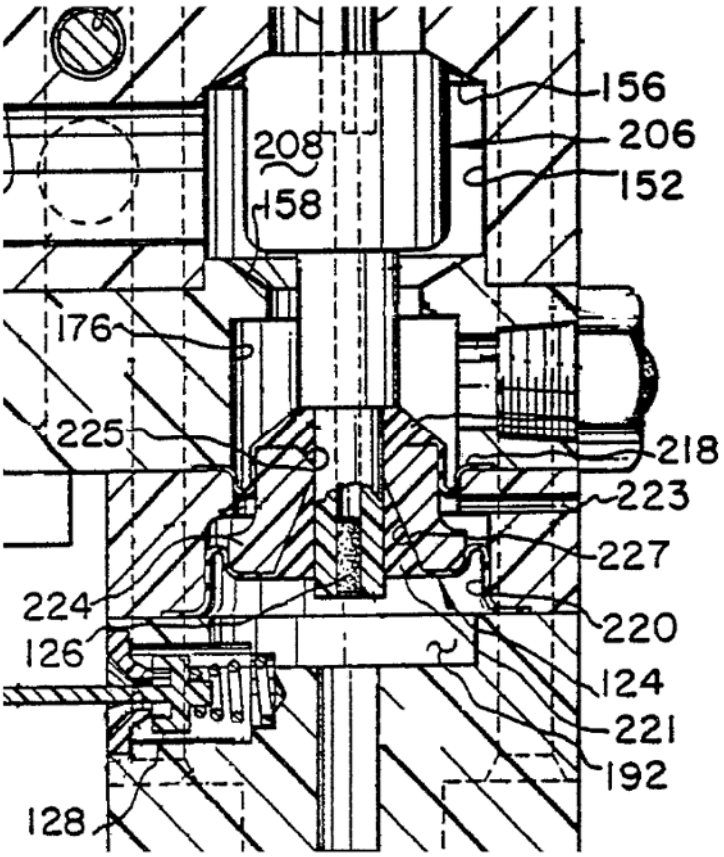
> *(1)(a) Identify the notional "person skilled in the art";*
> *(1)(b) Identify the relevant common general knowledge of that person;*
>
> *(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;*
>
> *(3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed;*
>
> *(4) Viewed without any knowledge of the alleged invention as claimed, determine whether those differences constitute steps which would have been obvious to the person skilled in the art.*

Novelty of claim 1

44. The request compares each feature of claim 1 against the prior art document and asserts they are all present. The observations refute that the diaphragm feature is shown because the identified diaphragm functions differently.

45. I agree that the prior art does show features *i., ii.* and *iii.* of claim, as there is clearly a pneumatic trap for exterminating rodents with a trigger mechanism that the rodent trips to cause a valve to actuate a pneumatic piston that operates a kill mechanism.

46. The request focusses on diaphragms found within the control valve module, and specifically indicates '*flexible rolling diaphragm members'* labelled 218 and 220, which are part of the pilot pressure actuator 124 of valve 116. Actuator 124 is also connected to the pressure release trigger valve 128. Below is the relevant portion of figure 6 showing the lower part of valve 116 (where some labels have been removed for clarity).



47. The request argues that diaphragm 220 falls within the scope of part *iv.* of claim 1 particularly as this faces the lower chamber 192 that is provided with the pilot pressure from the valve inlet side (which exits the central bore at the restrictor port 126). They argue that because pressure in cavity 192 acting against diaphragm 220 causes the actuator and thus valve body 206 to move to the closed position (illustrated) against valve seat 156, that this is equivalent to feature *iv.* Further they assert that when pressure in 192 is released by the trigger, the diaphragm 220 will again move with the rest of the actuator and thus the final part of claim 1 is disclosed.

48. The observations focus on arguing that it is body 206 that acts so it *'in a ready state blocks flow of the compressed gas'* as claim 1 requires, not diaphragm 220. Thus diaphragm 220 is different to that claimed.

49. In the observations in reply the requester agrees that the body 206 provides the physical barrier forming a blocking seal but argues that claim 1 does not require the diaphragm to provide this seal. In particular, to support the effect that the diaphragm '*blocks flow of the … gas'* they note diaphragm 220 (along with diaphragm 218) provides the force on the actuator to cause the valve to close, and they state:

> *The underlying idea between the dimensions and placements of diaphragms 218 and 220 is precisely that the difference in area between them causes a movement of these and thus a movement of closure member 206.*

50. I disagree that diaphragm 220 is equivalent to that required of the claim. This movement is not what claim 1 requires, as 220 does not act to itself provide the blocking seal against a valve seat. The diaphragm 220 is not a valve element moving onto and off a valve seat. The valve action instead is provided by the body 206 that moves on and off valve seat 156.

51. The diaphragm 220 does move (it flexes and rolls) when the valve opens and shuts, and it is involved with providing the force to cause that movement. At best, it could be argued that this diaphragm is acting indirectly to cause another element to *'…blocks flow…*', but this is not what I think the claim requires.

52. I therefor find that claim 1 is novel in the light of prior art. I thus do not need to consider the novelty of the dependant claims.

Inventive step

53. As I explain above, the request does not provide a sufficiently well argued attack on the obviousness of claim 1. Because I have found claim 1 to be novel, I will not consider the obviousness of the dependant claims.

Opinion

54. It is my opinion that claim 1 of the Patent is novel in the light of WO 85/03291 A1.

55. I decline to give my opinion regarding the inventive step of claim 1.

56. Accordingly, it is my opinion that the patent is valid based on the argument and evidence submitted by the requester.

Gareth Lewis
Examiner

NOTE

This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.