BL O/380/15
10 August 2015

PATENTS ACT 1977

APPLICANT	Neda Al-Anezi
ISSUE	Whether patent application GB1212787.4 complies with sections 1(1)(c) and 14(3)
HEARING OFFICER	H Jones

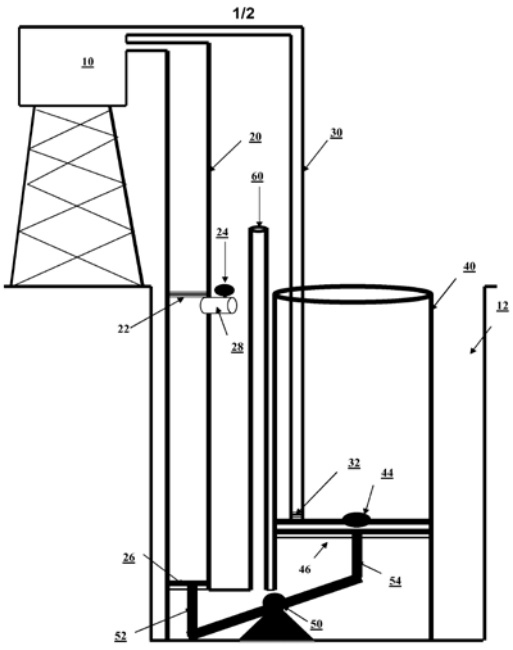
DECISION

Introduction

1 The application relates to a dynamic fluid pump for raising fluid from a basin to a tank against the force of gravity. It comprises an elaborate arrangement of pipes, reservoirs, valves and pistons that can be operated in such a way as to raise fluid from the basin without external power. The examiner considers that the pump cannot operate in the way described as it would contravene well known physical laws, and is therefore not patentable. The applicant disagrees and has asked for the matter to be decided on the basis of the papers. The applicant has provided two sets of detailed comments to aid understanding of the invention which the examiner has taken into account in his examination of the application.

The invention

2 A schematic illustration of the dynamic fluid pump is reproduced below:



3 The apparatus is described as a dynamic fluid pumping mechanism and comprises four vertical pipes 40, 30, 20 and 60 within a basin of fluid 12. Two of the pipes (30 and 20) are connected to fluid tank 10, pipe 60 acts as a vent and main pipe 40 extends up to the basin surface. Pipes 40 and 20 each have a piston at the bottom connected to a pivot assembly (46 and 26, respectively), which cooperate in such a way that when the piston in one pipe is at the top of its travel, the other piston will be at the bottom. Pipe 20 has a non-return valve 22 and a further valve 24 which opens into the basin at a level below the top of pipe 40. Pipe 40 has a main valve 44 which allows fluid to flow from the top of the pipe to the surface of the piston when open. Pipe 30 has a non-return valve 32.

4 Operation of the pump is described as follows. Fluid is allowed to fill basin 12, which will eventually pour through open valve 24 to fill pipe 20. Piston 26 will be forced down with the weight of fluid until it reaches the bottom of pipe 20. Valve 24 is then closed, which allows the basin to continue filling with fluid until it reaches the top of pipe 40. Fluid will then pour into pipe 40, and with valve 44 open, the weight of fluid in pipe 40 will eventually exceed the weight of fluid in pipe 20 and force piston 46 down and piston 26 up. The fluid in pipe 20 will flow through non-return valve 22 towards tank 10. Valve 24 is then opened and valve 44 closed at the same time. It is said that the mass of fluid in pipe 20 will then exceed the mass of fluid in pipe 40, i.e. beneath valve 44 and acting on piston 46, which will force piston 26 down and piston 46 up. The fluid in pipe 40 will then flow through non-return valve 32 and up pipe 30 towards tank 10. Valve 24 is then opened and valve 44 closed, and the whole process is repeated “again and again”.

The law

5 Section 1(1)(c) of the Act requires an invention to be capable of industrial application and section 14(3) requires that the disclosure to be clear enough and complete enough for the invention to be performed by a person skilled in the art. It is settled law that devices which operate in a manner contrary to well established physical laws are not capable of industrial application because such devices cannot physically be made to operate in the way suggested. The description of such a device must also be regarded as being unclear and incomplete on the basis that the invention can never be performed by a person skilled in the art no matter how it is described in the specification of an application.

Analysis

6 The examiner suggests that there is a fundamental flaw in the applicant’s explanation of how the pump might operate. He says that the forces acting on the pistons 26 and 46, and hence on the connecting rods 52, 54, are a function of the piston areas and fluid pressure, and not the weight of fluid as described. He explains that fluid pressure is directly proportional to the height of fluid and does not depend on the volume of fluid or pipe diameter, and refers to Pascal’s Law and Pascal’s barrel experiment to illustrate the point. He suggests that the most that could be achieved by opening and closing the valves 24 and 44 is to allow an equilibrium position to be reached in which the forces on both pistons is equal or where one of the pistons is at the end of its stroke; controlling the valves thereafter will do nothing to disrupt the equilibrium.

7 The applicant has attempted to convince the examiner that the pump would work in the way described and has provided separate drawings to help illustrate the eight basic steps involved in the pumping cycle. The examiner has said that he generally agrees with steps 1-7 of how the invention is intended to work. At step 8, the applicant explains that when valve 24 is opened and valve 44 is closed, the weight of liquid in pipe 20 will be greater than the weight of liquid between piston 46 and the main valve 44 in pipe 40, and that this will force piston 46 up and allow liquid to pass up into pipe 30. The examiner says that this cannot occur because the pressure of fluid acting down on piston 46 before and after closure of main valve 44 will be the same and so the piston will not move. The fluid pressure acting on piston 46 is proportional to the height of fluid in pipes 40 and 30, and simply closing main valve 44 will not alter the pressure acting on the piston underneath.

8 I agree with the examiner's analysis of step 8 of the pumping process. The fluid pump cannot work in the way described in the application nor can it be made to operate in a repeated fashion "again and again" in order to raise fluid to an elevated tank. Moreover, a system which purports to do work to raise the potential energy of a fluid without an external source of energy violates the law of conservation of energy. The examiner is therefore correct to describe the invention as a perpetual motion machine.

Conclusion

9 The specification does not meet the requirements of section 14(3) because the invention cannot operate in the way described and cannot therefore be reproduced by a person skilled in the art. The invention contravenes the law of conservation of energy and is therefore incapable of industrial application as required by section 1(1)(c). I therefore refuse the application under section 18(3).

Appeal

10 Any appeal must be lodged within 28 days after the date of this decision.

H JONES
Deputy Director, acting for the Comptroller