THE JOINT EXAMINATION BOARD

PAPER P3

PREPARATION OF SPECIFICATIONS FOR UNITED KINGDOM AND OVERSEAS PATENTS

19th April, 1994

10.00 a.m. - 2.00 p.m.

Please read the following instructions carefully. This is a FOUR HOUR Paper.

1. In the appropriate boxes at the top of each sheet please enter the designation of the paper, the question number, and your Examination number. Write on one side of the paper only using BLACK ink. You must NOT staple pages together. You must NOT state your name anywhere in the answers.

2. NO printed matter or other written material may be taken into the examination room.

3. Answers MUST be legible. If the examiners cannot read a candidate's answer no marks will be awarded.

THE JOINT EXAMINATION BOARD

PREPARATION OF SPECIFICATIONS FOR UNITED KINGDOM AND OVERSEAS PATENTS

19th April, 1994

10.00 a.m. - 2.00 p.m.

The invention for the purposes of this question is the well-known domestic water tap which is to be taken as new.

Figure 1 shows one embodiment of the invention. Referring to Figure 1, a tap 10 comprises a main body 11, a spout 12 and a tubular lower part 13 designed for connection to a water supply. The main body 11 houses a rising spindle 14 which is connected to a rotatable head 15 for allowing a user to regulate water flow. The body 11 comprises an internally screw-threaded barrel 16 which receives a correspondingly screw-threaded portion of the rising spindle 14 so that, as the head 15 is turned, the spindle 14 moves up or down according to the direction of rotation of the head 15. The spindle 14 is fitted with a resilient washer 17 which locates against a seat 18 formed in the base of the main body 11 of the tap 10.

By screwing the washer 17 down against the seat 18, water flow is prevented. As the rising spindle 14 rotates and lifts the washer 17 further away from the seat 18 progressively more water flows until a maximum flow rate is reached when the washer 17 is completely clear of the seat 18. When the washer becomes worn it can be replaced by turning off the water at the mains and dismantling the tap 10.

One disadvantage of the embodiment described above is that because the washer 17 rotates with the head 15 it rotates against the seat 18 and so is prone to wear. An improvement on this embodiment, which overcomes that disadvantage, is the non-rising head tap shown in Figure 2. In a tap 20 of Figure 2, a head 21 is rotatable but does not move up and down on rotation. A spindle 22 connected to the head 21 has a threaded lower portion. A sleeve 23 is internally threaded for threaded engagement with the spindle 22 and has a washer 24 attached thereto. The sleeve 23 is prevented from rotating by being keyed into the main body of the tap 20 so that keying projections (not shown) from the sleeve 23 slide up and down in keying slots (not shown) in the body. The washer 24 engages a seat 25 to prevent water flow.

The tap 20 is constructed so that rotation of the head 21 causes the threaded spindle 22 and washer 24 to rise and lower vertically without rotation, thereby reducing wear of the washer 24 during use. One possible problem with this arrangement is that limescale deposits may interfere with the keying of the sleeve 23 in the tap body. An alternative embodiment which avoids this problem is shown in Figure 3 which shows a fragment of the lower part of a spindle 26 in an embodiment which is similar to that of Figure 1.

The spindle 26 is shown formed with a bore 27. A t-section piston 28 is located as a rotatable sliding fit in the bore 27 and a washer 29 is attached to the base of the piston 28. In this alternative embodiment there is no need for a sleeve surrounding the spindle. When the spindle 26 is raised away from the valve seat, water pressure ensures that the piston 28 remains fully inserted in the bore 27. When the spindle 26 is screwed down so that the washer 29 engages the valve seat, the piston 28 does not rotate with the spindle so that the washer 29 does not rotate relative to the valve seat.

One piece of prior art is the plug cock shown in Figures 4a and 4b. The plug cock is a simple flow control device for use in connection with a fluid container C provided with a pipe P. A plug A has a passage B which is rotatable so that it can be aligned with the pipe P to allow fluid to flow out of the container C or positioned at right angles to the pipe P to prevent fluid flow. Figure 4a shows the plug cock in the closed position and Figure 4b shows it in the open position. Although some degree of regulation of fluid flow can be achieved using a plug cock this does not provide very reliable flow control and the flow of fluid tends to open the plug A further if it is left in a partially open condition.

A second piece of prior art is a push valve for a petrol mower as shown in Figure 5a and 5b. A valve housing H is connected by a duct to a petrol tank. The housing is formed with a spout at one end which is a push fit into the end of a hose for supplying petrol to the engine of the mower. The housing contains a valve member V comprising a head D and a tapered end T. An O-ring O surrounds the valve member to prevent leakage. In order to close the valve (the position shown in Figure 5a), the valve member is pushed into the housing so that the tapered end of the valve member seals the spout. Pulling the valve member out of the housing to the position shown in Figure 5b opens the spout and allows petrol to flow to the hose. This simple push-pull arrangement is adequate for a petrol mower because only a closed/fully open function is required but is unsuitable for use when reliable regulation of fluid flow rate is required.

No other prior art is to be considered.

****

On the basis of the above please draft:-

1. Claims for a UK patent application; (60 marks)

2. A single independent US claim (10 marks)

3. The body of a European patent application up to, but not including, the description of the drawings. (30 marks)

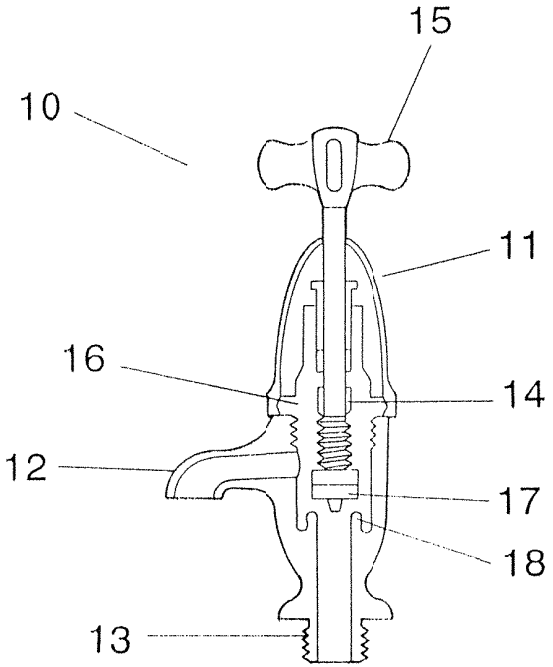

Figure 1

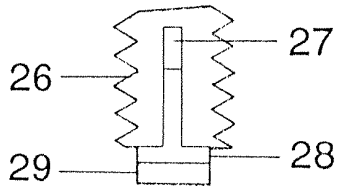

Figure 3

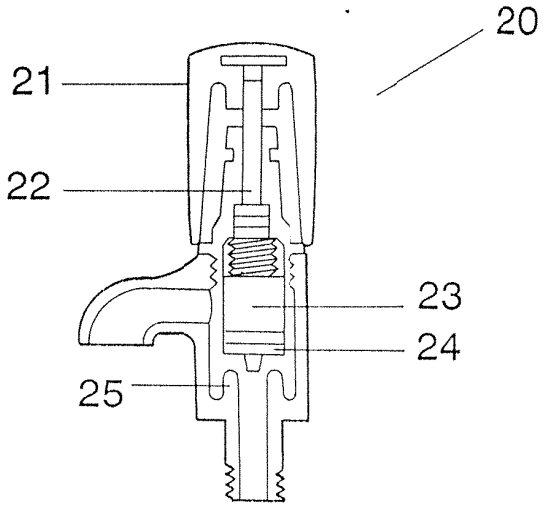

Figure 2

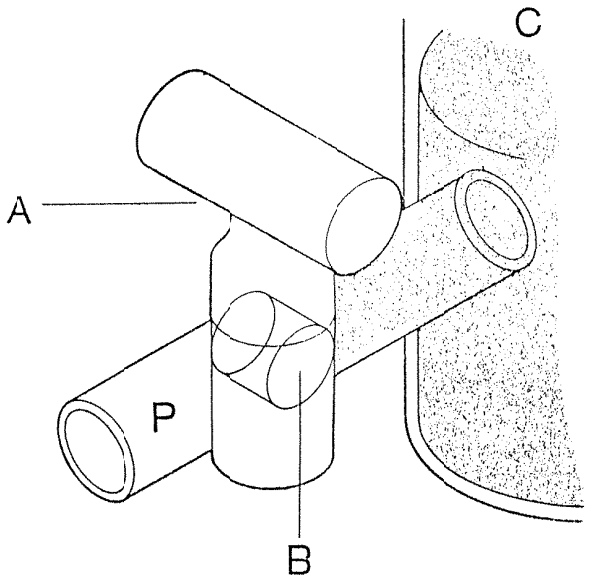

Figure 4a

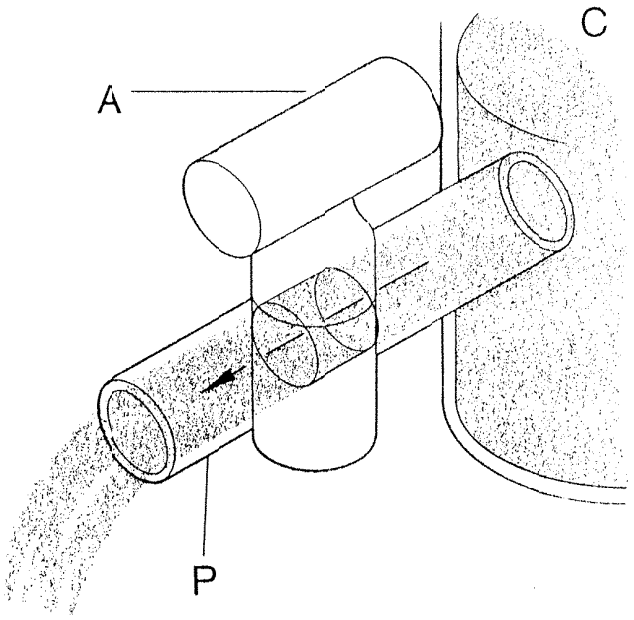

Figure 4b

Figure 5a

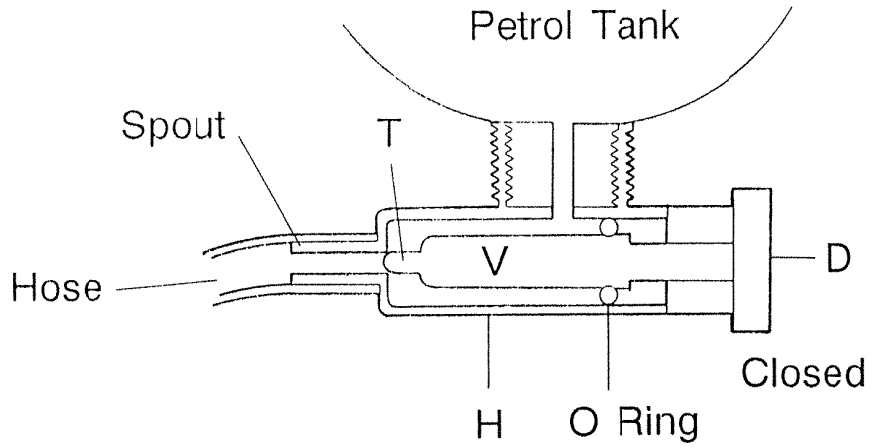

Figure 5b