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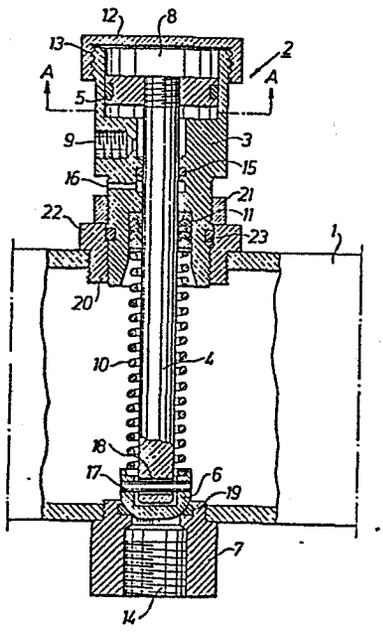
(54) **Spray bar valve.**

(57) The present invention relates to a device for spreading bituminous binder on roads, for example, and consists of a spray bar (1) and a number of valves (2) arranged along it for opening and closing the spray bar nozzles (14). The spray bar valve consists of a pressure cylinder (3) with an extended piston rod (4). The cylinder (3) is screwed into the wall of the spray bar and the piston rod or valve spindle (4) protrudes into the spray bar to the opposite wall in which the valve seat (7) with the spray nozzle (14) is mounted. The end of the valve spindle (4) facing the valve seat is fitted with a valve cone (6) which is mounted so as to be capable of movement in relation to the valve spindle.

*Fig.1*

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# SPRAY BAR VALVE

DYNAPAC MASKIN AKTIEBOLAG

The present invention relates to a device for spreading bituminous binder and in particular to a valve device for achieving improved regulation of the amount of binder it is intended to spread.

When spreading bituminous binder in liquid form on roads the equipment generally used is a vehicle-mounted tank equipped with a spray tube or spray bar arranged transversely to the direction of travel of the tank. Arranged along the spray bar are a number of openings or nozzles through which the binder is sprayed, these being equipped with valves which can be opened and closed.

The control system for opening and closing the spray bar valves is generally arranged so as to enable simultaneous operation of an arbitrary number of valves as well as individual operation of each separate valve, which is essential for attaining the desired spreading conditions.

It is also important that movement of the valve during the opening and closing operations is not adversely affected by the design of the valve and its mounting in the spray bar.

In valve systems so far known, radial forces on the valve spindle often arise with wear in the spindle seal and spindle guide as a result. In the valve system according to the present invention, purely axial movement of the valve spindle is obtained which results in longer cylinder and valve seat life and consequently more effective opening and closing of the valve.

The invention will be described in greater detail with reference to the enclosed drawing, where Fig. 1 shows a longitudinal cross-section of a valve and its mounting in a spray bar. Fig. 2 shows a cross-section through the valve along the line A-A in Fig. 1.

Shown in Fig. 1 is a spray bar 1 in which a valve 2 is mounted. The valve is controlled by means of a pressure medium and is constructed like a conventional compressed air cylinder with attendant piston and piston rod. The cylinder portion 3 is threaded into the spray bar 1 and the piston rod, which in the present case is called valve spindle 4, is extended and protrudes out of cylinder 3 into spray bar 1.

Valve spindle 4 is fitted at the end inside the cylinder portion 3 with a piston 5 and the other end with a valve cone 6 and extends diametrically from the cylinder portion 3 to the opposite wall of spray bar 1, into which a valve seat 7 corresponding to valve cone 6 is screwed. Valve 2 opens and closes as valve cone 6 is moved into and out of contact with valve seat 7.

Valve piston 5 is capable of movement inside cylinder space 8, which communicates with an opening 9 in the cylinder wall through which pressure medium can be admitted to cylinder space 8, thus causing the piston 5 and with it valve cone 6 of valve spindle 4 to move away from contact with valve seat 7. The valve is returned to contact with valve seat 7 by means of a spring 10, which is so pretensioned that it keeps the valve closed in the event of a loss of pressure medium. Another purpose of spring 10 is to pretension the seal 11 which is designed to prevent binder from seeping out of spray bar 1

into cylinder 2 during the movement of the valve. The seal 11 consists of V-rings which owing to the wedging effect are pressed against valve spindle 4 and cylinder housing 3.

The spring 10 is in this connection so dimensioned that it keeps the seal pretensioned even after a certain amount of wear has arisen in seal 11.

The cylinder space 8 is limited at the top by a sleeve-shaped cover 12 screwed onto the cylinder. The outer wall of the cylinder housing is hexagonal in order to provide a better grip for an adjustable spanner, for example, when the housing is screwed into position in the wall of the spray bar. The cover 12 is cylindrical, however, and so sized that gaps 13 are formed between the cylinder housing and the cover 12. These gaps serve as bleed channels for the air present above piston 5 when pressure medium is injected through opening 9 to press piston 5 upwards and consequently open the valve so that binder can flow out of spray bar 1 through the valve opening 14. To prevent pressure medium from entering spray bar 1 the cylinder space 8 is sealed at the bottom by means of a sealing ring 15 which seals against valve spindle 4 and cylinder housing 3. If leakage of pressure medium or binder occurs as a result of wear in seal 15 or seal 11, for example, it will be diverted through a drain channel 16 arranged in the wall of the cylinder housing.

Since cylinder housing 3 and valve seat 7 are mounted so far away from each other, a high degree of mounting precision is necessary to ensure that an effective valve seal will be obtained. To eliminate this problem valve cone 6 is bowl-shaped and fitted over the lower end of valve spindle 4 with a certain

degree of radial clearance. By means of a pin 17 which passes through a hole 18 in the lower end of spindle 4 and extends on either side of the spindle through holes in the cone wall, cone 6 is retained in place on valve spindle 4. The diameter of hole 18 is larger than the diameter of pin 17, which enables cone 6 to move axially in relation to valve spindle 4.

The mounting of cone 6 accordingly permits both axial and radial movement relative to valve spindle 4, as a result of which the requirement of precision in connection with fitting the cylinder housing and valve seat can be substantially reduced without necessitating any sacrifice of the sealing requirement.

In order to satisfy the sealing requirement still further, a sealing ring 19 is fitted in valve seat 7. This ring is of soft material and one of its properties is that the binder in spray bar 1 does not adhere to it. Since ring 19 is of soft material, sealing between it and valve cone 6, is assured even if a solid particle should find its way between the cone and the valve seat ring during the valve closing operation. The solid particle will in such event be pressed into the ring without any gap arising. Next time the valve is opened the solid particle will be flushed out with the binder through opening 14.

The hole in spray bar 1 into which the cylinder portion 3 is screwed can be suitably reinforced with an internally threaded bush 20. The cylinder portion 3 is screwed into bush 20 until a stop nut or stop ring 21 on the cylinder housing abuts against a flange 22 arranged on bush 20. To prevent binder from seeping out between the threads of the bush, a sealing ring 23 is arranged between the cylinder housing and the bush.

CLAIMS

1. A device for spreading bituminous binder embracing a spray bar and a number of pressure medium controlled valves arranged along it for opening and closing the spray bar nozzles, the said valves consisting of a pressure cylinder mounted in the spray bar, a piston which is actuated by the pressure medium and capable of axial movement inside the cylinder and a valve spindle connected to the piston and extending into the spray bar for internal sealing of a valve seat mounted in the wall of the spray bar and oriented diametrically in relation to the pressure cylinder, characterized in that the end of the valve spindle (4) facing the valve seat (7) is equipped with a valve cone (6) which is capable of axial and radial movement in relation to the valve spindle (4) and in that a sealing ring (19) of resilient material is arranged on the valve seat (7).

2. A device as in Claim 1, characterized in that the valve spindle (4) is fitted with a pretensioned spring (10) for the purpose of keeping the valve cone (6) pressed against the valve seat (7) and pretensioning the seal (11) in the event of a loss of pressure medium.

3. A device as in Claim 1, characterized in that the valve cone (6) is bowl-shaped and by means of a pin (17) mounted in it the cone is pivoted at the lower end of the valve spindle (4), whereby the cone (6) is so sized that it surrounds the lower end of the valve spindle (4) with a radial clearance and in that the pin (17) extends diametrically from one side of the cone (6) to the other side and through the lower end of the valve spindle (4), whereby the hole in the valve spindle (4) is larger than the diameter of the pin (17) and so enables the cone (6) to move axially in relation to the valve spindle (4).

Fig.1

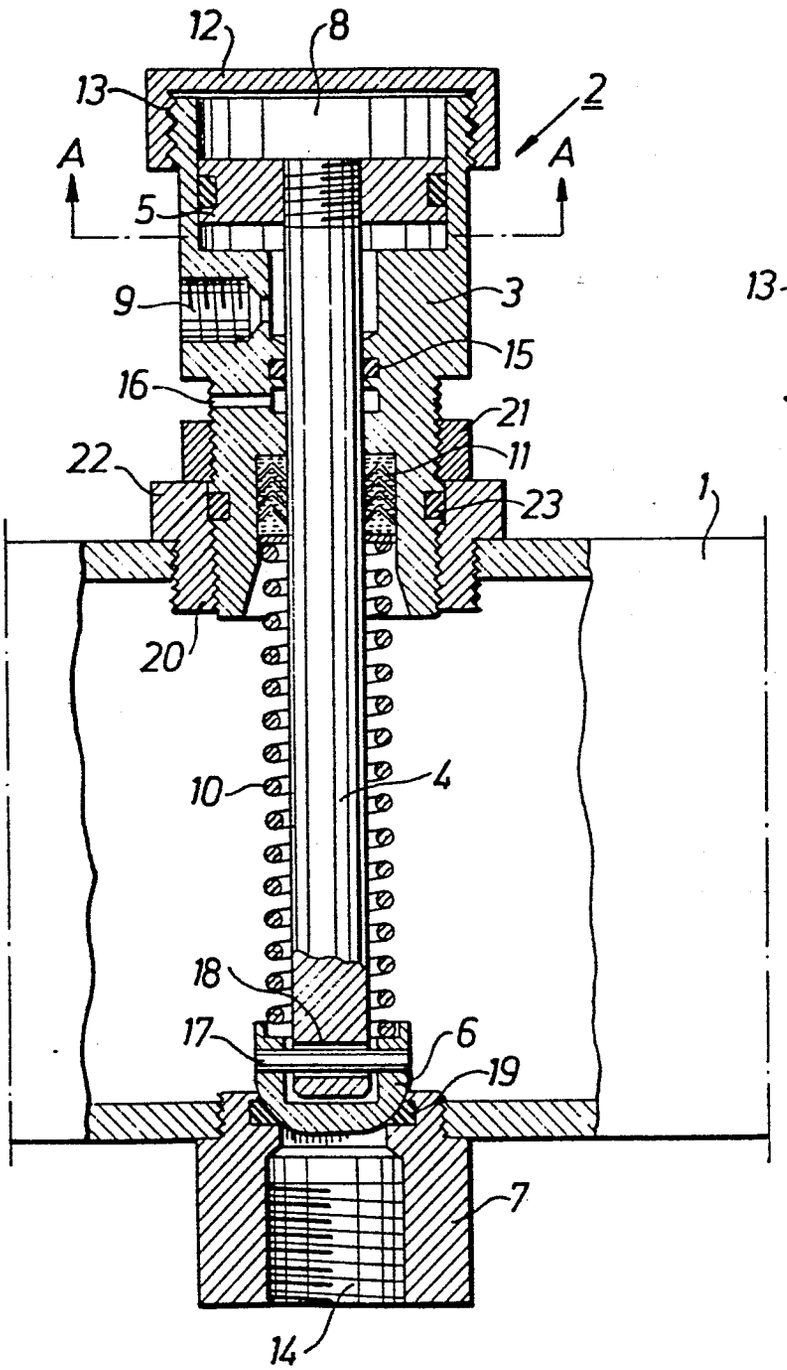
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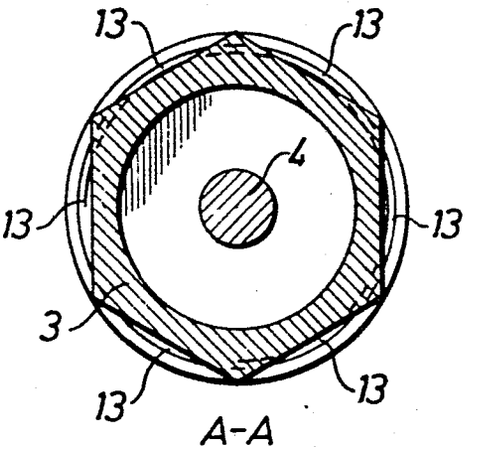
Fig.2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# EUROPEAN SEARCH REPORT

0116704
Application number
83112237.9

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl. ³) |
|---|---|---|---|
| A | DE-A-2 323 852 (BECK H)<br>* Claim 1, fig 1 | 1-3 | E 01 C 19/17 //<br>F 16 K 31/122 |
| A | SE-A-8204205-2 (PEDERSEN M)<br>* Page 3, lines 17-25 and lines 28-34<br>Page 5, last part from line 26-34 | 1-3 | |
| A | FR-A-2 455 125 (KOZUTI GEPELLATO VALLALAT)<br>* Page 9, line 23 to page 10 line 8, claims 1 and 2, fig 2 | 1-3 | |
| A | DE-B-1 195 123 (SHAFER VALVE COMPANY)<br>* Page 2, column 3, line 56 to column 4 line 11, fig 2 | 1-3 | |
| A | FR-A-1 018 718 (HOLLINGBERY M W B)<br>* Fig | 1-3 | |

TECHNICAL FIELDS SEARCHED (Int. Cl. ³)

E 01 C

F 16 K

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| STOCKHOLM | 10.05.84 | ÅS, SUSANNE |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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