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R. LUCIEN

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FLUID DISTRIBUTOR DEVICE

Filed Dec. 8, 1959

Fig. 1

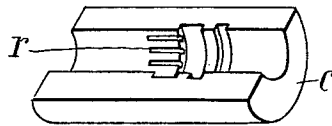


Fig. 2

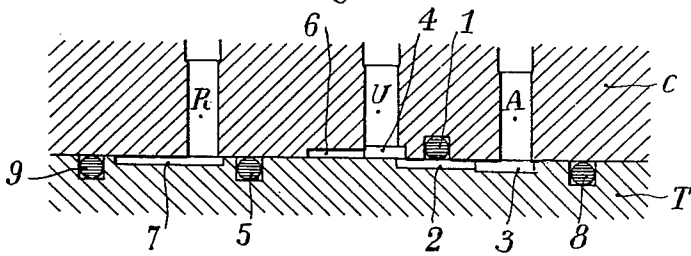


Fig. 3

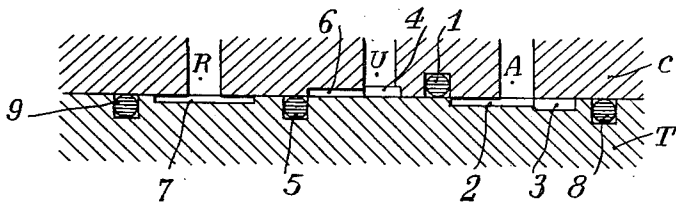


Fig. 4

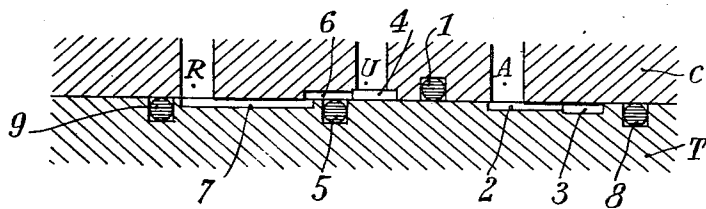


Fig. 5

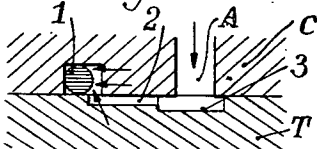
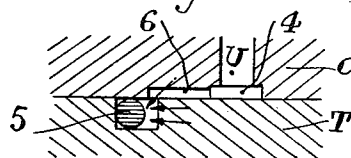


Fig. 6



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This invention relates to fluid distributors.

Among all known fluid distributors, the distributors of the slide-valve type are held in greatest favor because of their simplicity of operation. They are generally formed as two units which slide with respect to each other, these units being hereinafter referred to respectively as the body and the slide-valve.

Fluid-tightness between the two units is provided either by high mechanical precision or by means of linings of rubber or the like. In this latter case, the distributors are limited to low pressure since the linings are rapidly damaged by their passage over orifices of the distributor.

A distributor of the lining type provided in accordance with the present invention is exempt from this cause of deterioration and can consequently be employed for high fluid pressures.

The present invention is characterized in that intercommunication between the orifices of a distributor body is obtained by means of two series of longitudinal grooves, one series being cut in the internal surface of the distributor body and the other in the slide-valve, the emplacement of the linings being judiciously selected so that, in one position of the slide-valve, one series of grooves is placed astride one lining and puts one pair of orifices of the distributor body into communication, so that in another position of the slide-valve, another series of grooves is placed astride another lining, thus putting into communication another pair of orifices of the distributor and so that in a third position of the slide-valve, the orifices are isolated from each other.

The number of grooves is a function of the rate of flow to be obtained.

It should be understood that, as in case of the distributors which are of the type most commonly employed, one of the orifices can be common to the two pairs of orifices. There will be described below a distributor, provided in accordance with the present invention, comprising a distributor body having three orifices.

The distributor is illustrated by the accompanying drawing in which:

FIG. 1 is a view in perspective of a longitudinal cross-section of a member of the distributor body.

FIG. 2 is a diagram showing a relative position of the body and of the slide-valve in which the orifices A and U are put into communication.

FIGS. 3 and 4 are similar diagrams for two other relative positions of the body and the slide-valve.

FIGS. 5 and 6 respectively illustrate the co-operating portions of the body and of the slide-valve, showing the action of the fluid on the fluid-tight linings.

In FIG. 1 can be seen how the longitudinal grooves *r* which are cut in the surface of the body C are arranged. The said grooves open into a channel in the bottom of which is pierced one of the orifices of the distributor body. The adjacent channel is intended to serve as a housing for a fluid-tight packing.

FIGS. 2, 3 and 4 show diagrammatically the relative positions of the body C and of the slide-valve T of the distributor, respectively in their position of supply (A and U in communication), in their position of isolation (A, U and R isolated) and in their position of return to a tank or to open air (R and U in communication).

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The body C is provided on its internal surface with a circular channel for a packing 1, and the piston slide-valve T is provided with three channels on its external surface for three packings 5, 8 and 9. In the internal surface of the body C are cut longitudinal grooves 6 which open into the channel 4. A utilization orifice U opens into channel 4. In the slide-valve there are cut longitudinal grooves 2 and the circular channel 7 and a circular channel 3 into which the grooves 2 open.

The sealing packing 1, or so-called admission packing, is disposed between the admission orifice A and the utilization orifice U.

FIG. 2 shows the slide-valve in the supply position.

Astride the supply packing 1 are the grooves 2 of the slide-valve which put into communication the channels 3 and 4, thus establishing communication between the supply orifice A and the utilization orifice U. The return to the tank through R is prevented since this latter orifice is isolated by the packing 5.

FIG. 3 corresponds to the position of isolation of the three orifices. In this position, each of the orifices is isolated between two sealing packings.

The position of FIG. 4 is that of the return to the tank or to the open air. Astride the packing 5 of the return to the tank are the grooves 6. These grooves couple together the channel 4 and the channel 7, thus establishing communication between U and R. The supply A is isolated by the packings 1 and 8. In the case in which R is a return orifice to the open air, the packing 9 is not essential.

The arrangement of the packings 1 and 5 which come into rubbing contact with the edges of the grooves is so determined that during the operation of the slide-valve T, the pressure of the fluid constantly tends to force back the packing into its channel and not to apply the said packing against the grooves.

FIG. 5 shows the action on the packing 1 of the pressure of the fluid coming from A. It can be seen that the packing 1 is forced back by the fluid onto the bottom of the channel, the pressure of the fluid working in the direction of the arrows. Damaging of the packing when this latter comes into contact with the edges of the grooves is thus prevented. This result is achieved due to the fact that the channel housing the packing is cut in the interior of the body C and not in the slide-valve T.

The packing 5, on the contrary, is housed in a channel cut in the slide-valve. The pressure of the fluid coming from U, at the moment when the packing 5 comes opposite the grooves 6, forces back the packing 5 into the bottom of its channel, thus permitting of the passage of the packing over the grooves without risk of damage.

It can be seen that the packing 1 of the body works in extension while the packing 5 of the slide-valve works in compression.

The particular arrangement of the packings of the distributor permits of the use of this latter for high pressures. It can be employed for all liquid or gaseous fluids.

What I claim is:

1. A fluid distributor comprising a distributor body having a cylindrical cavity, three transverse bores being provided in said body, said bores being adapted for connection respectively to a fluid inlet source, a fluid utilization source and a fluid return source, said body having in correspondence with each of said bores an orifice opening into said cavity, said orifices thus constituting utilization, inlet and return orifices, the utilization orifice being positioned between the other two orifices, a cylindrical slide piston in said cavity and movable axially therein, said distributor body having a circular groove encircling and opening into said cavity in correspondence with said utilization orifice and axially extending grooves in communication with said circular groove and extend-

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ing towards the return orifice; the slide piston having a first annular peripheral groove adapted to communicate with the inlet orifice and being further provided with axially extending grooves in communication with said annular groove and being adapted in cooperation with the latter to establish communication between the inlet orifice and the utilization orifice with the slide piston in predetermined position, said slide piston being further provided with a second annular peripheral groove of an axial extension adapted to establish communication between the utilization orifice and the return orifice with the slide piston in a further predetermined position; two circular gasket channels being provided respectively in the distributor body in communication with the cavity between the inlet and utilization orifices and on the slide piston between the axially extending grooves and said second annular groove, and packings in each of the channels for providing a fluid tight relation between the

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slide piston and the distributor body, said packings being deformed under the action of fluid pressure with said packings facing said grooves such that said packings are deformed in a direction away from said grooves to prevent entry of said packings into said grooves.

2. A distributor in accordance with claim 1 in which the section of the channels in a diametral plane is rectangular and the section of the packings in the same plane is circular.

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