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(54) **Shock absorber**

(57) In order to reduce noise in a shock-absorber, a screen (10) pierced by ports (8) surrounds a valve (3) which is normally held by a spring (5) against a seat (4) in the bottom plate (2) of the cylinder (1). In this way, any pressure shock generated by the descending piston (not shown) is applied to the underside rather than the top of the valve.

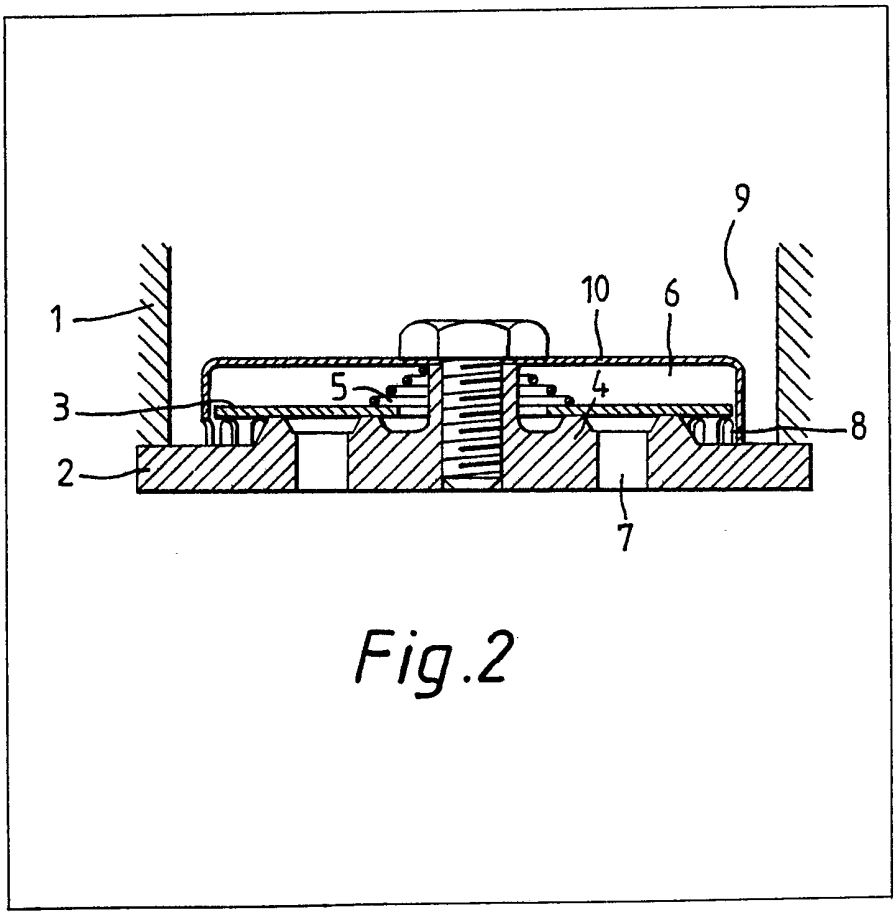

Fig.2

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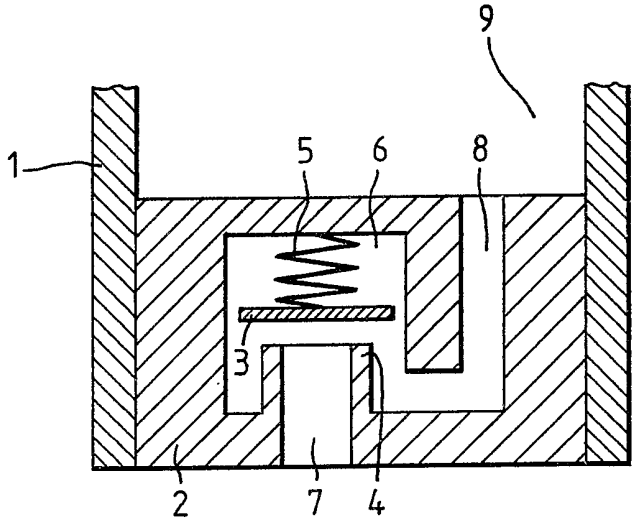

Fig.1

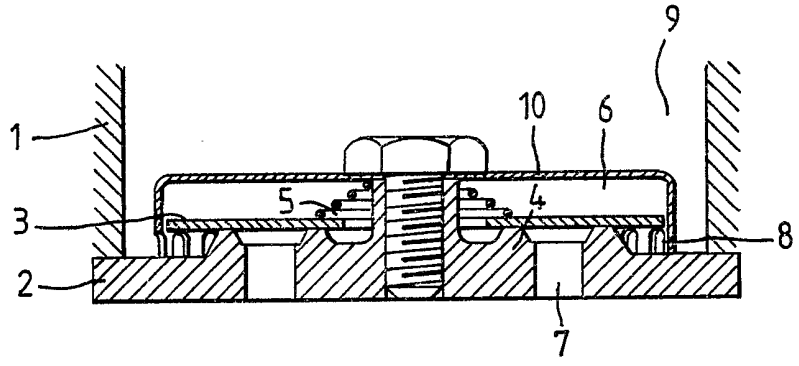

Fig.2

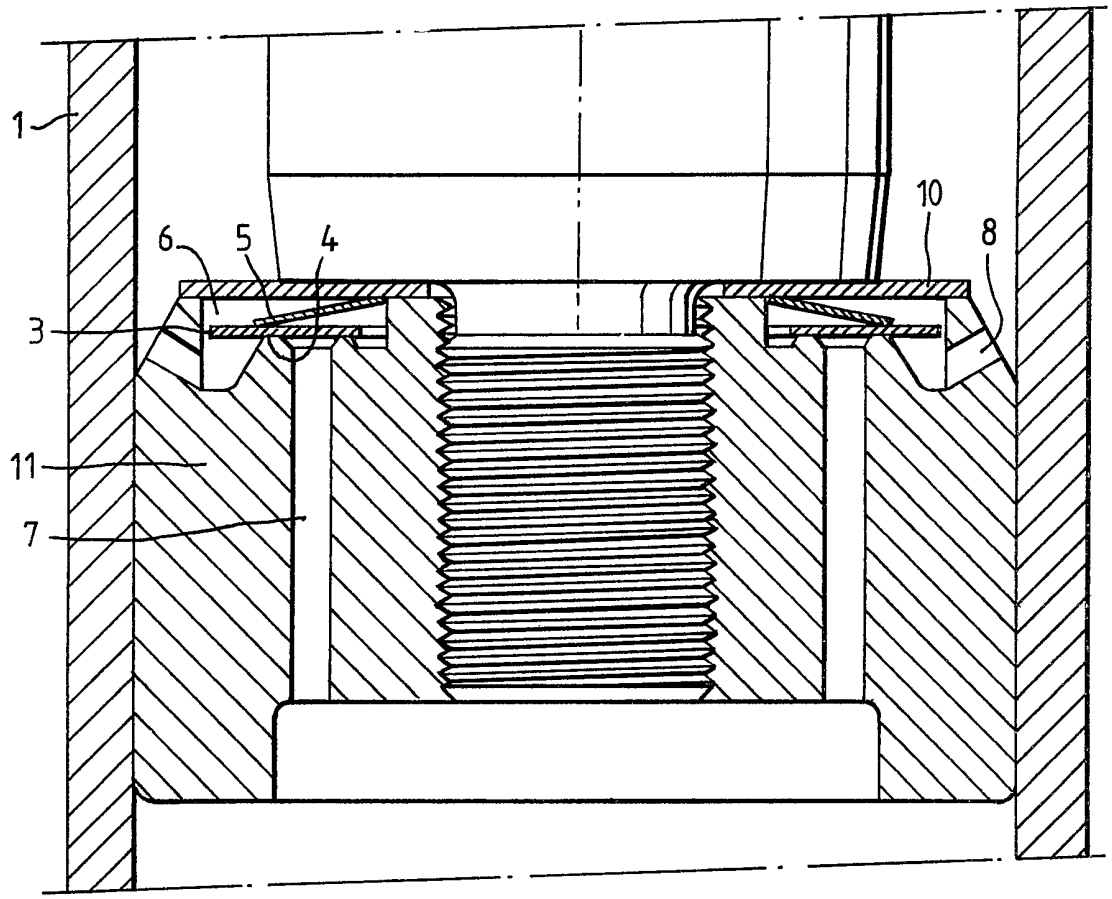

Fig.3

SPECIFICATION

Shock absorber

This invention relates to shock absorbers and particularly to a valve assembly for a shock absorber of the kind provided with a valve chamber containing a valve co-operating with a valve seat, the valve being held in a predetermined position by means of pretensioning means such as a spring and in which one or more supply channels lead to the valve seat side of the valve.

A valve assembly of this kind is known from Dutch patent specification Nr. 135.353.

This known valve assembly has the following drawback. Let it be assumed that such a valve assembly is applied as a check valve opening in the direction of the cylinder — a so-called bottom valve — in a shock asborber and that the piston is rising. In that case, the valve assembly will be in opened condition, the valve being at a certain height above the valve seat. Upon an abrupt inversion of the piston movement a pressure wave can be created in the damping medium under certain circumstances, which pressure wave is propagating opposite to the direction of flow of the oil which is present at that moment.

The valve closing at the moment of inversion of the piston movement strikes the valve seat extra hard due to this pressure wave, which is moving in the same direction as the closing valve, thus produced an annoying noise.

An object of the invention is to provide means to obviate this drawback. This object is attained in that a created pressure wave is no longer made to act directly on the closing valve, but by protecting the valve in the opening direction against pressure waves in the closing direction and by bypassing the pressure waves through channels in such a way that they act on the closing face of the valve so that their propagation direction is opposite to the closing direction of the valve.

According to the invention in its broadest aspect, a valve assembly of the kind referred to is characterised in that a screen is provided which is offset in the opening direction of the valve, which screen has sufficient rigidity to protect the valve against pressure waves of the medium in the closing direction of the valve and in that the medium can only reach the side of the valve turned away from the valve seat in an unhindered way through one or more of the supply channels debouching in the valve chamber in a location lying at that side of the plane through the valve seat where the supply channels to the valve seat side of the valve are located.

Embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 shows a diagrammatic drawing of a portion of a shock absorber of the kind wherein the invention can be applied,

Fig. 2 shows an embodiment of the invention.

Fig. 3 shows another embodiment of the invention.

In Fig. 1 the reference number 1 refers to a lower part of the cylinder of a shock absorber in the bottom portion 2 of which a valve assembly is arranged consisting of the valve 3, a valve seat 4, a pressure spring 5, a valve chamber 6, a supply channel 7 and a supply channel 8.

The valve assembly is shown in its opened position which is created upon raising of the piston (not shown) contained in the cylinder. The oil flow through the raised valve is in that case directed to the lower cylinder space 9. Upon abrupt inversion of the direction of the piston movement, a pressure shock created thereby, will propagate downwards and will be led through the supply channel 8 to the underside of the valve 3. Consequently, the direction of the pressure shock in the valve chamber with respect to the valve is opposite to the closing direction of the valve and, as a result, the valve will not be closed with a hard strike on the valve seat 4, but will be closed relative gradually. In this way, the production of noise is prevented and the life of the valve and the valve seat lengthened. The parts between the valve chamber and the lower cylinder space 9 should be sufficiently strong to ensure that the pressure shock will not be transmitted by these parts to the upper side of the valve as, in that case, the advantages of the invention will be totally or partly lost.

Fig. 2 shows a practical embodiment of a valve assembly according to the invention. The reference numbers correspond to those of Fig. 1 and the function is identical, with the exception that the valve in Fig. 2 is shown in closed position. The screen 10 is of rigid material and supported on the bottom 2 to obtain a good protection of the valve 3 with regard to a pressure shock in a downward direction. The medium is permitted to pass through the screen 10 through the series of port-shaped supply channels 8.

Fig. 3 shows another embodiment, in which the valve assembly is applied in a piston 11. Also here the reference numbers, as far as necessary, correspond to those according to Figs. 1 and 2, and the function will be clear without further explanation after what has already been said.

CLAIMS

1. Valve assembly for a shock absorber of the kind provided with a valve chamber containing a valve co-operating with a valve seat, the valve being held in a predetermined position by pretensioning means, such as a spring, and in which one or more supply channels lead to the valve seat side of the valve, characterised in that a screen is provided which is offset in the opening direction of the valve in relation to the valve, which screen has sufficient rigidity to protect the

valve against pressure waves of the medium in the closing direction of the valve and in that the medium can only reach the side of the valve turned away from the valve seat in an unhindered way through one or more supply channels debouching in the valve chamber in a location lying at that side of the plane through the valve seat where the supply channels to the valve seat side of the valve are located.

2. Valve assembly for a shock absorber substantially as described with reference to the accompanying drawings.

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