

The invention relates to a volumetric flow regulator for air-conditioning and ventilating systems, having a flap which is pivotable in a flow duct, the pivotal shaft of which flap has a lever arm with which a spring pivotally co-operates.

Various constructions of such volumetric flow regulators are known. They operate mechanically in an automatic fashion, as the flow-induced torque of the flap is compensated for by the spring. When the flow conditions change, so also the pivotal position of the flap changes. A condition of this however is that the spring must be specially calibrated for each regulator.

The purpose of the invention is to propose a mechanically automatic volumetric flow regulator in which the spring may be adapted to the regulating procedure by simple adjustment.

This purpose is fulfilled in that the spring is a leaf spring, one end of which is connected to the lever, and the other end of which is secured to a cam in such a way that, when the cam is displaced

about a pivot point, the leaf spring is carried along by the cam and moves along the cam curve, and in that a means is provided for securing the cam. It is sufficient, in order to adapt the leaf
5 spring to the respective regulator, to rotate the cam about its pivot point until the leaf spring has attained the required initial spring tension. Thus the spring constant and the direction of application of force also change in a general way.
10 After displacement of the cam to the required values, this position of the cam is secured.

It may be appropriate that a connecting-rod or connecting cable is provided in order to connect
15 the lever to the associated end of the leaf spring. In this way the possible uses of the constructive design are extended.

A preferred embodiment of the invention is
20 characterised by a means such that the unstressed leaf spring extends substantially orthogonally to the flow duct.

An embodiment of the invention, given by way of
25 example and shown in the drawing, will be

explained in the following; the single Figure shows diagrammatically the front elevation of a volumetric flow regulator.

- 5 There may be seen in the Figure a flow duct 1 with a flap 3 mounted on a pivotal shaft 2; the said flap 3 may be pivoted out of its basic position, shown in dotted lines, and out of the sphere of influence of flow forces of the airflow 6, and
10 against the force of a spring 5, in the direction of the arrow 4.

Mounted to pivot about a pivot point 7 at the flow duct 1 is a cam 8, which may be secured by means
15 of a device (not shown) for fixing it in various pivotal positions. Attached to the lower end in the Figure to a curved portion 9 formed by the cam 8 is the spring 5, which is in the form of a leaf spring. The other end of the spring 5 is flexibly
20 connected to a connecting-rod 10 or to a connecting cable with a lever 11, which sits on the pivotal shaft 2 of the flap 3.

Shown in extended lines is the unstressed spring
25 5, which at this point extends substantially

orthogonally to the flow duct 1, or to the direction of flow. Shown in dotted lines is an operative position in which the cam 8 has been pivoted through a specific angle in the direction of arrow 12. During this pivoting movement, the leaf spring 5 moves along the curved portion 9 of the cam 8, its end connected to the connecting rod undergoing a bending action. Thus the spring constant, the initial spring tension and the direction of application of force on the lever 11 change.

Should the properties of the regulator require to be changed, then it is sufficient to release the cam 8 and displace it into another position.

Patent Claims

1. Volumetric flow regulator for air-conditioning and ventilating systems, having a flap (3) which
5 is pivotable in a flow duct (1), the pivotal shaft (2) of which flap has a lever arm (11) with which a spring (5) pivotally co-operates, characterised in that the spring (5) is a leaf spring, one end of which is connected to the lever (11), and the
10 other end of which is secured to a cam (8) in such a way that, when the cam (8) is displaced about a pivot point (7), the leaf spring (5) is carried along by the cam (8) and moves along the cam curve (9), and in that a means is provided for securing
15 the cam (8).

2. Volumetric flow regulator according to claim 1, characterised in that a connecting-rod (10) or connecting cable is provided in order to connect
20 the lever (11) to the associated end of the leaf spring (5).

3. Volumetric flow regulator according to claim 1 or 2, characterised by an arrangement such that
25 the unstressed leaf spring (5) extends substantially orthogonally to the flow duct (1).