Sept. 1, 1953 C. C. MITCHELL 2,650,571

SEALING MEANS FOR SLOTTED CYLINDERS

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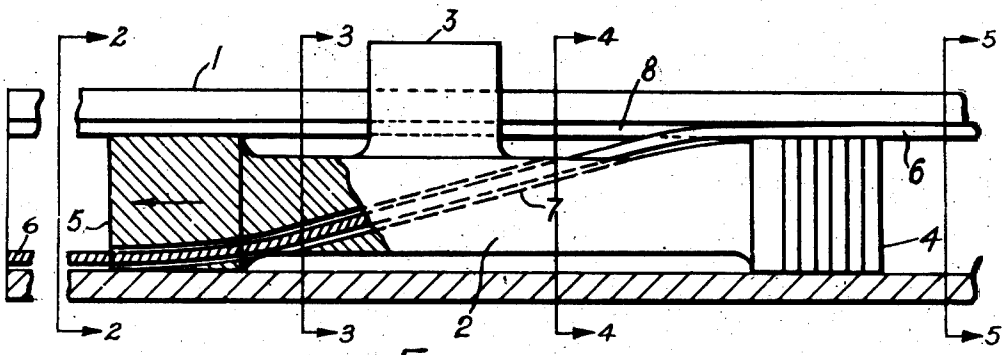


FIG. 1.

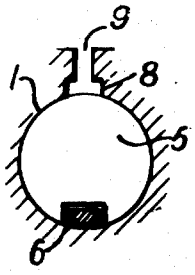


FIG. 2.

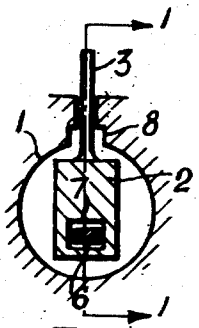


FIG. 3.

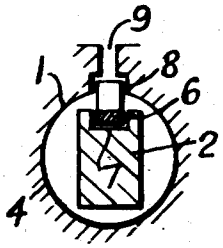


FIG. 4.

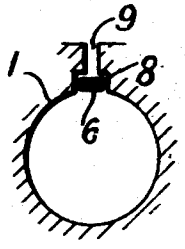


FIG. 5.

Inventor
Colin Campbell Mitchell
by
Pennie, Edmonds, Morton and Barrows
Attorneys

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SEALING MEANS FOR SLOTTED CYLINDERS

Colin Campbell Mitchell, Edinburgh, Scotland, assignor to Brown Brothers & Co. Limited, Edinburgh, Scotland, a corporation of Great Britain

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2 Claims. (Cl. 121—1)

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This invention relates to improvements in the structure of rigid, slotted cylinder and piston assemblies.

The piston comprises a guide piston head at the forward end, considered in the direction of the working or power stroke, and a sealing piston head at the after end, these piston components being connected by a distance piece carrying a lug which projects through a longitudinal slot in the cylinder and imparts motion to an external body to be propelled.

It is assumed that the cylinder is horizontal or inclined at an angle to the horizontal and that the slot extends along the summit of the cylinder wall.

In the present construction a recess is formed in the cylinder wall above the bore of the cylinder and at the lower end of the slot.

A sealing strip, which may be metallic or non-metallic, and of rectangular or other section, lies in the bore of the cylinder at the bottom of the cylinder in front of the piston in the direction of the power stroke of the piston.

During the working stroke the sealing strip does not move axially relatively to the cylinder, but it passes through a guide channel formed within the piston, and in the forward travel of the piston is displaced radially and elevated from the bottom of the cylinder, and placed within the recess.

The pressure of the working fluid which acts upon the sealing piston head also acts upon the sealing strip and forces it against seats presented by the recess, whereby the cylinder is sealed against the escape of working fluid, which may be either liquid or gaseous.

The sealing strip may lie within the cylinder freely in front of the piston or it may be subjected to a pretetermined tension applied at the forward end of the sealing strip. At the after end the sealing strip is rigidly anchored to the cylinder.

A cylinder and piston assembly according to the invention is illustrated in the accompanying drawing in which Fig. 1 is a longitudinal section taken along line 1—1 of Fig. 3 and Figs. 2–5 are transverse sections taken along the lines 2—2, 3—3, 4—4 and 5—5, respectively, of Fig. 1.

Referring to the drawing, 1 denotes a longitudinally slotted cylinder accommodating a piston including a rear or sealing piston head 4 and a front or guide piston head 5. The piston heads 4, 5 are interconnected by a distance piece 2 having a lug 3 which projects through the longitudinal slot 9 in the cylinder 1 and is adapted

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to impart motion to an external body (not shown) to be propelled.

It is assumed that the cylinder 1 is horizontal or inclined at an angle to the horizontal and that the slot 9 extends along the summit of the cylinder wall, as shown.

A recess 8 is formed in the cylinder wall above the bore of the cylinder 1 and at the lower end of the slot 9.

A sealing strip 6, which may be metallic or non-metallic, and of rectangular or other section, lies in the bore of the cylinder along the bottom of the cylinder in front of the piston.

During the working stroke the sealing strip 6 does not move axially relatively to the cylinder, but it passes through a guide channel 7 formed within the piston, and in the forward travel of the piston is elevated from the bottom of the cylinder, and placed within the recess 8 in front of the sealing piston head 4.

The pressure of the working fluid which acts upon the piston head 4 also acts upon the sealing strip 6 and forces it against seats presented by the recess 8, whereby the cylinder 1 is sealed against the escape of working fluid, which may be either liquid or gaseous.

The sealing strip 6 may lie within the cylinder freely in front of the piston or it may be subjected to a predetermined tension applied at the forward end of the sealing strip. At the after end the sealing strip 6 is rigidly anchored to the cylinder 1. It is important to note that the sealing strip in lying along the bottom of the cylinder in front of the piston is supported thereby and consequently it is unnecessary to apply any great tension to the sealing strip. If the sealing strip were in the "up" position in front of the piston, then on account of the length of the cylinder and the weight of the strip, the strip would tend to sag after the manner of a taut wire with the result that natural vibration might be imparted to the strip in front of the moving piston with the possibility of damaging the strip.

What is claimed is:

1. In a cylinder and piston construction in which the upper portion of the wall of the cylinder is provided with a longitudinal slot in which a lug operated by the piston moves, said cylinder being provided with a recess in the cylinder bore in register with and symmetrical to the longitudinal slot therein, said piston having front and rear ends in the direction of its power stroke and being provided with a guide channel extending obliquely through the piston from adjacent

the periphery of the front end thereof at its lower front side rearwardly to its upper side, the upper end portion of said guide channel being in register with said recess, and a sealing strip located within said cylinder a portion of which extends through said guide channel and into said recess, the portion of the sealing strip extending through the guide channel being adapted to be displaced radially upwardly by the forward movement of the piston in its power stroke and moved into sealing engagement with said recess, substantially the entire portion of the sealing strip in front of the piston lying along and on the bottom of the cylinder, whereby substantially the entire portion of the sealing strip lying in front of the piston in its power stroke is uniformly and continuously supported along its length.

2. In a cylinder and piston construction in which the upper portion of the wall of the cylinder is provided with a longitudinal slot in which a lug operated by the piston moves, said cylinder being provided with a recess in the cylinder bore in register with and symmetrical to the longitudinal slot therein, said piston having a front guide piston head and a rear sealing piston head in the direction of its power stroke, said heads being interconnected by a distance piece, a lug connected to the distance piece and extending through the slot in the cylinder wall, said piston being provided with a guide channel extending obliquely through the piston from the lower front side of the guide piston head rearwardly

through the guide head and the distance piece, the upper end portion of said guide channel being located to the rear of said lug and in register with said recess, the ends of said guide channel terminating in slots in the periphery of the guide piston head and the sealing piston head, respectively, and a sealing strip located within said cylinder a portion of which extends through said guide channel and into said recess, the portion of the sealing strip extending through the guide channel being adapted to be displaced upwardly and into said recess by the forward movement of the piston, substantially the entire portion of the sealing strip in front of the piston lying along and on the bottom of the cylinder in position to be displaced upwardly by the forward movement of the piston, whereby substantially the entire portion of the sealing strip lying in front of the guide piston head in the power stroke of the piston is uniformly and continuously supported along its length.

COLIN CAMPBELL MITCHELL.

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