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CONTROLLING MEANS FOR PLUNGER PUMPS

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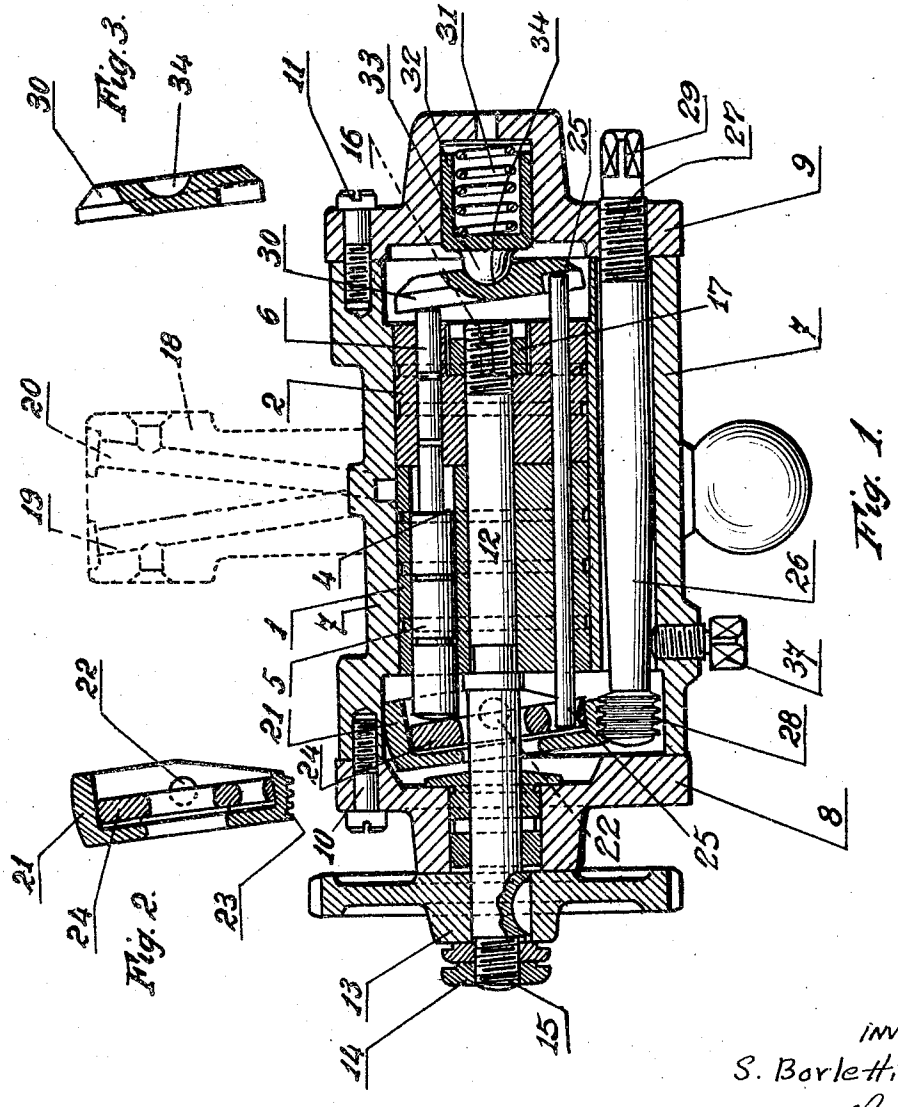


Fig. 1.

Fig. 2.

Fig. 3.

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CONTROLLING MEANS FOR PLUNGER PUMPS

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The present invention relates to improvements in plunger pumps with cylindrical rotating body and particularly in the pumps formed by a cylindrical rotor longitudinally crossed by several cylinders and turning into a casing in the ends of which are placed respectively two inclined disc cams parallel to each other which during the operation of the rotor cause the reciprocating sliding movement of the pistons placed inside the cylinders formed in the rotor itself, to wit the cylinders of the pump. In these pumps the inclination of the disc cams controlling the movement of the pistons, may, as it is well known, be regulated by means of a suitable device, from the practical design and manœuvring of which mainly depends the good working of the pump.

The improvements forming the object of the present invention relate to the means for regulating the inclination of the disc cams controlling the pistons and consist in the fact that in order to vary the said inclination, action is had from the outside only on one of the cams, the parts being so disposed that the other cam always follows the inclination of the driven cam, remaining parallel to the latter, caused by the action of a spring pushing it against the pistons of the rotor cylinders.

Suitable mechanical means may be used to vary the inclination of the cam, for instance a shaft mounted in the rotor casing, parallel to the latter and provided with an enlarged threaded portion engaging a toothed segment provided on the outer peripherical surface of the cam.

This controlling system, compared with the other systems in which both the cams are operated presents the advantage that the difficulties met in operating both the control gears of the discs in exactly the same manner, also after a long use of the pump, are avoided.

The object of the invention will be easily understood with reference to the accompanying drawing illustrating by way of an example one of the embodiments of a plunger pump with cylindrical turning body improved as above described.

In the said drawing:

Fig. 1 is a longitudinal section of the pump;

Fig. 2 is a detail of the cam controlled by the controlling device;

Fig. 3 is a detail of the free cam and subjected only to the action of a spring.

According to the drawing, —1— and —2— are two cylindrical rotor sections rigidly secured together in any suitable manner and forming the rotor of the pump; —4— is one of the cylinders of the pump; —5— is the piston provided with a stem —6—; —7— is the casing in which the rotor turns; —8— and —9— are two covers for the casing connected to the latter by means of screws —10— and —11—; —12— is the rotor shaft operated by the toothed wheel —13— fixed on the shaft by means of the nut —14—, screwed on the threaded end —15— of the shaft, the other threaded end —16— of which is screwed into the casing —7— and the ring —17— which holds the rotor in its place; —18— is a fitting portion of the casing —7— carrying the tubular connections —19— and —20— of the pump; —21— is the controlled cap-like cam pivoted on the pivot —22— crossing the shaft —12—, the cam being provided on its peripherical surface with a toothed segment —23—; —24— is a replaceable disc placed into the said cam; —25— is a bar sliding in an aligning bore in rotor sections —1— and —2— and loosely connecting the recessed discs —24— and —30— with the rotor.

This bar —25— like the piston —5— and stem —6— projects beyond the ends of the rope and is slightly longer than the combined lengths of the pistons and their stems. —26— is a shaft serving to regulate the inclination of cam —21—, the said shaft being screwed at —27— to the casing —7— and cover —9— and provided with a threaded portion —28— which is engaged with the segment —23—; —29 is the adjusting head of the shaft —26—; —30— is the free cam or disc pushed against the pistons of the pump by the spring —31— arranged in a bush —32— sliding in the cover —9— and engaging with its spherical lug —33— a corresponding recess —34— of disc

—30—; —37— is a set screw for controlling the position of the shaft.

It is obvious that the details of construction of the pump and the device controlling the inclination of the cams may be varied from those illustrated and described without departing from the spirit of the invention.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, I declare that what I claim is:

1. A pump of the character described, including a casing, a rotor mounted therein and provided with longitudinally extending cylinders, a piston and its stem arranged in the cylinders projecting beyond the ends of the rotor, recessed discs arranged at the respective ends of the casing and contacting with the projecting end of the piston and its stem, a bar slidably mounted through the rotor and slightly longer in length than the combined lengths of the piston and its stem and loosely connected at its ends with the recesses in the discs, a cap-like cam surrounding one of the discs and mounted for oscillatory movement in the casing, manually adjustable means operable from a point exteriorly of the casing for regulating the inclination of the cam and consequently the discs, and a yieldingly mounted thrust bearing arranged at the end of the casing opposite the cam and universally engaged with the adjacent and free disc for holding this disc in yielding contact with the adjacent ends of the stem and bar to ensure of the free disc being inclined simultaneously with and corresponding to the inclination of the first mentioned disc.

2. A pump as claimed in claim 1, wherein the end of the casing housing the bearing is provided with a recess and wherein the bearing includes a cap-like element, the outer end of which is formed with a cylindrical boss for universal contact with the free disc, and a spring enclosed within the recess and the cap-like member and bearing against certain parts, substantially as and for the purposes set forth.

In testimony whereof I affix my signature.

SENATORE BORLETTI.