

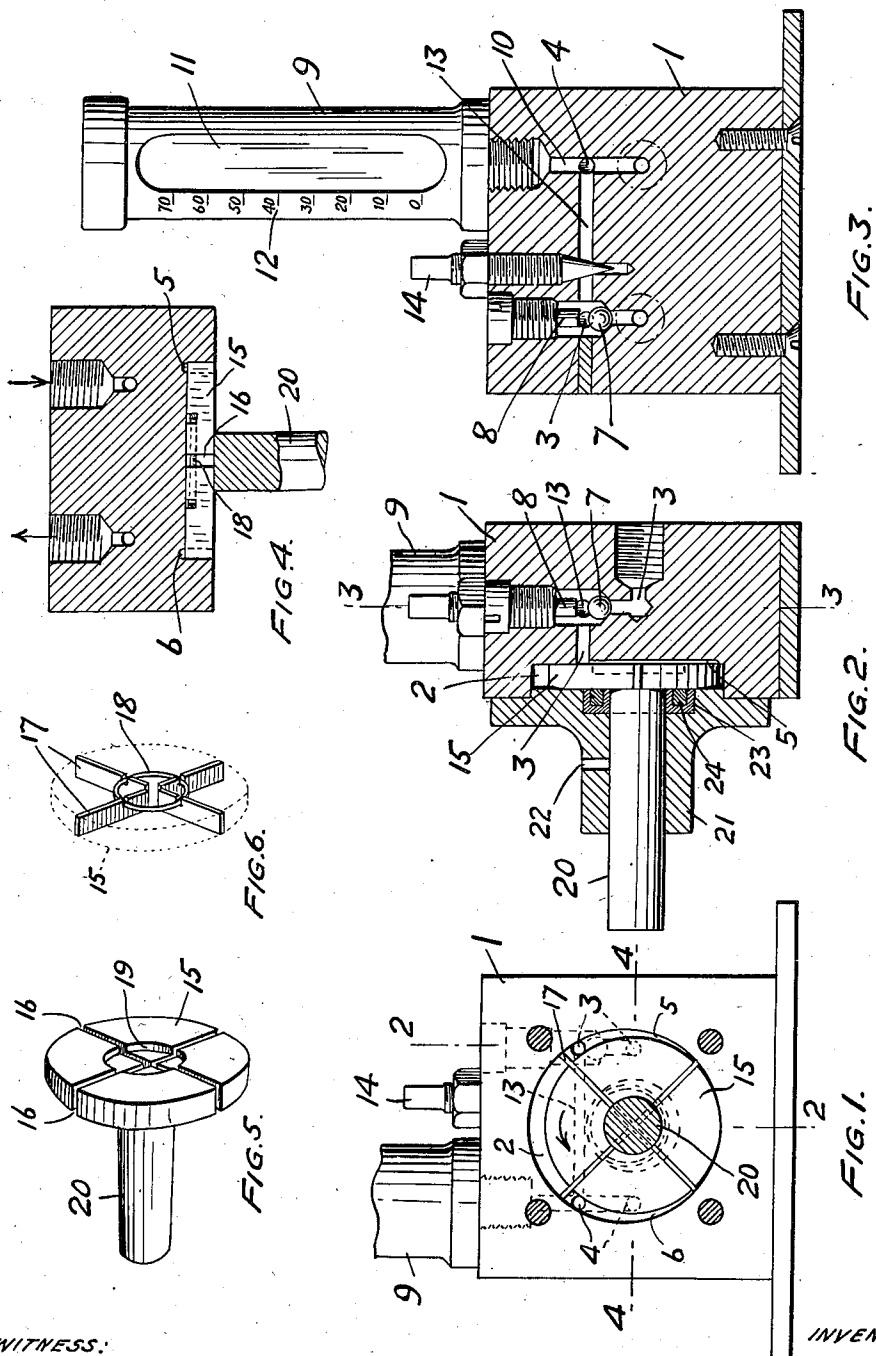
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PUMP

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WITNESS:

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PUMP

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2 Claims. (Cl. 103—137)

Objects of the present invention are to insure a constant rate of delivery to a spinneret of material to be formed into artificial silk threads, to trap air from the material and give an indication of flow, to adjust for wear and to equalize the rate of delivery without stopping the flow, to provide a pump of simple construction which will effect the above mentioned objects, and to provide a simple, reliable and efficient pump for the purpose stated.

Other objects of the invention will appear from the following description at the end of which the invention will be claimed.

Generally stated the invention comprises a block having a cylinder with inlet and outlet passages through its face wall at points spaced substantially ninety circular degrees apart and the face wall of the cylinder having leak grooves from the inlet and outlet passages extending towards each other and part way around the cylinder; and said block having a ball check valve in the inlet passage and a pressure chamber communicating with the outlet, and said block provided with a by-pass channel from the outlet to the inlet on the delivery side of the ball check valve; in association with a needle valve for the by-pass, and a rotary piston eccentric in the cylinder and having spring pressed impeller blades in cruciform arrangement.

The invention also comprises the improvements to be presently described and finally claimed.

In the following description reference will be made to the accompanying drawing forming part hereof and in which,

Figure 1 is a front view of a pump embodying features of the invention with the cylinder cover removed.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a view taken on the line 4—4 of Figure 1.

Figure 5 is a detached perspective view of the piston, and

Figure 6 is a detached view of the impeller blades.

Referring to the drawing, 1 designates a block and it is provided with a cylinder 2 having an inlet passage 3 and an outlet passage 4 arranged through the face wall of the cylinder and disposed at points spaced substantially sixty circular degrees apart. The face wall of the cylinder is provided with leak grooves 5 and 6 from

the inlet and outlet passages and extending toward each other part way around the cylinder for sixty circular degrees more or less. 7 is a ball check valve arranged in the block and operative in the inlet passage 3. 8, Figures 2 and 3, is a stop for the ball check valve. 9 is a pressure chamber, Figure 3, communicating with the outlet passage 4 by a branch 10 and this chamber 9 is mounted on the block and is provided with a window 11 and a scale 12 and is adapted to retain at the top thereof an air column supported on the fluid which is being delivered by the pump. 13 is a by-pass channel in the block and it extends from the outlet passage to the inlet passage on the discharge side of the ball check valve, Figure 3. 14 is a needle valve mounted in the block and operative in the by-pass 13. 15 is a rotary piston mounted eccentric in the cylinder and on its face it is provided with cruciform slots 16. 17 are notched impeller blades and one is arranged in each slot 16. 18 is a resilient ring mounted in the notches of the impeller blades and arranged in cavity 19 in the piston. The piston shaft 20 is mounted for rotation in the cylinder head or cover 21 and it may be lubricated through the oil hole 22. 23 is a packing ring U-shape in cross section and containing a core as of metal 24.

The mode of operation may be described as follows, and it may be assumed that the fluid, which is to be converted into artificial silk through the intervention of a spinneret, not shown or described because too well understood, enters the intake 3 under pressure of five or ten pounds more or less and is delivered at the outlet 4 under pressure of fifty pounds more or less. It is, of course, understood that the piston 15 is rotated and that the impeller blades 17 operate to push the fluid through the pump. The purpose of the leak grooves 5 and 6 is to let some of the fluid pass from in front of the impellers to the rear thereof and in this way the rate of delivery from the pump to a spinneret is constant. To adjust the flow to compensate for wear or for any other purpose the needle valve 14 is adjusted thus changing the flow through the by-pass and the needle valve can be adjusted while the pump is in operation. The ball check valve 7 serves to prevent pressure on the discharge side of the pump from reaching the intake of the pump when the latter is at rest. The chamber 9 performs two functions: it traps air that leaves the material being pumped, and since the fluid being pumped rises

in the chamber 9, against air confined at the top of the chamber, the level of the liquid in respect to the scale 12 gives an indication of the operation of the pump, by indicating the

5 pressure in the outlet passage.

It will be obvious to those skilled in the art to which the invention relates that modifications may be made in details of construction and arrangement and in matters of mere form without departing from the spirit of the invention which is not limited in respect to such matters or otherwise than as the prior art and the appended claims may require.

I claim:

15 1. A pump for supplying an artificial silk solution to a spinneret comprising in combination, a block having a cylinder and having inlet and outlet passages through the face wall of the cylinder at points spaced 90° apart, the face wall
20 of the cylinder having leak grooves from the inlet and outlet passages and extending towards each other and part way around the cylinder, a ball check valve arranged in the block and operative in the inlet passage, a pressure chamber
25 communicating with the outlet and mounted on the block, a by-pass channel in the block from the outlet passage to the inlet passage on the discharge side of the ball check valve, a needle

valve mounted in the block and operative in the by-pass, a rotary piston eccentric in the cylinder and having on its face cruciform slots facing the leak grooves, a notched impeller blade in each slot, and a ring mounted in the notches of the impeller blades. 5

2. A pump for supplying an artificial silk solution to a spinneret comprising in combination, a block having a cylinder and having inlet and outlet passages through the face wall of the cylinder at points spaced 90° apart, the face wall of the cylinder having leak grooves from the inlet and outlet passages and extending towards each other and part way around the cylinder, a ball check valve arranged in the block and operative in the inlet passage, a stop for the ball check valve, a pressure chamber communicating with the outlet and mounted on the block, a by-pass channel in the block from the outlet passage to the inlet passage on the discharge side of the ball check valve, a needle valve mounted in the block and operative in the by-pass, a rotary piston eccentric in the cylinder and having on its face cruciform slots facing the leak grooves, a notched impeller blade in each slot, and a ring mounted in the notches of the impeller blades. 10 15 20 25

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