June 9, 1931. G. NEMETZ 1,809,489

PUMP FOR SPINNING LIQUID SUCH AS VISCOSE

Filed July 5, 1928

Fig. 1

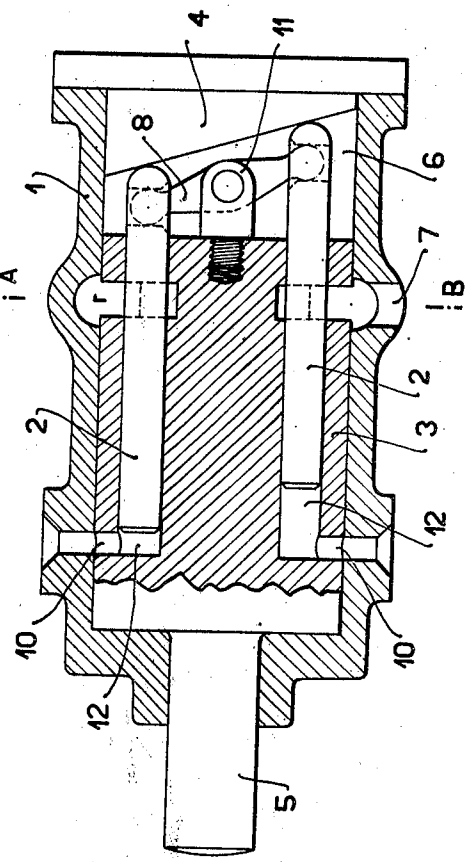
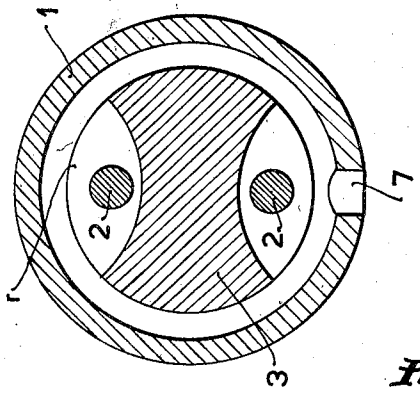


Fig. 2



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UNITED STATES PATENT OFFICE

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PUMP FOR SPINNING LIQUID SUCH AS VISCOSE

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This invention relates to pumps for spinning liquids such as viscose of the type having a plunger or plungers for conveying the liquid and it has for its object to prevent certain serious defects of this type of pumps due to the fact that the viscose will when passing the pump be liable to mix with the lubricating liquid of said pump, such as oil. As it is necessary to have the pump lubricate, such mixture of the liquid passing through the pump with the lubricant can generally not be avoided but it proves to be very harmful for the production of a good and uniform filament and moreover it also interferes with the satisfactory operation of the pump itself.

It is very difficult in the known types of rayon pumps to avoid such mixing of the liquids because the driving mechanism of the pistons or plungers must be completely submerged in lubricating oil and thus it is unavoidable that some oil will penetrate into the pressure space by creeping between the piston and the cylinder and some viscose will penetrate into the oil chamber containing the driving mechanism in the same way so that mixture of the liquids to some extent will always occur.

According to this invention this defect is eliminated by providing a slot or cutting or interruption in the carrier body or cylinder of the pistons near the end which faces the driving mechanism, thus creating a chamber or room surrounding the piston which is in permanent connection with the exterior.

In pumps for other purposes and of other type than that mentioned above, chambers or small spaces have been provided which surround the working member of the pump and in which the lubricant or the liquid to be conveyed that may happen to penetrate along the rotating shaft or other working member is collected. However these known expedients cannot be adapted for viscose pumps on account of the fact that viscose and similar spinning liquids are subject to rapid incrustation or solidification when relatively small quantities are in contact with the air and especially also when in contact with oil. A single annular space closely surrounding the working member would therefore be filled in very short time by a solid mass surrounding the piston and would form a kind of sealing body growing continuously by the arrival of fresh liquid and oil and interfering finally with the correct working of pump.

According to this invention therefore the cutting or slots provided between the free end of the piston and the driving mechanism are so arranged that they open with a relatively large opening so that they may be easily inspected and cleaned. Moreover when the casing surrounds the piston carrier it is necessary to provide corresponding openings in said casing so that it is possible to clean the chambers or rooms frequently and without difficulty by some suitable tool (preferably hook shaped).

Thus the unavoidable amount of mixture between the two liquids due to the creeping of the liquids along the piston will occur within a room or chamber, removed from the operating parts or operating chambers. Whenever a solidification or incrustation occurs in the chambers it may leave the chambers by gravity, if not too large. Large incrustations that do not leave the chambers from their own accord will however be readily observed and may be removed by a suitable tool.

The invention is illustrated diagrammatically by way of example in the accompanying drawings, which show one of the approved types of viscose pump, in Fig. 1 in longitudinal section and in Fig. 2 in a cross section along the line A—B of the Fig. 1.

As usual with the type of viscose pumps illustrated in the drawings the pump consists of a cylindrical casing 1, housing a plurality of plunger piston pumps 2. The pumps housed within the casing are contained within a cylindrical piston carrier 3 containing cylindrical bores 12 acting as pump cylinders, within which the pistons may reciprocate. In the example shown two pumps are arranged within said carrier. The pistons 2 are reciprocated by rotating the whole piston carrier 3 within the casing 1 by means of the driving shaft 5. The reciprocating movement is obtained by means of a guide mechanism for the pistons which is arranged at the end of the

piston carrier 3 opposite to the driving shaft 5 and which consists of a chamber 6, provided with a guiding block 4 of wedge like shape having an inclined guiding surface along which the rounded ends of the pistons may slide during rotation. The two pistons are connected by means of a two armed lever 8 having its fulcrum between the pistons in the axis of the piston carrier and the bearing 11 for the fulcrum is preferably carried by said piston carrier 3. By rotating the shaft 5 with the piston carrier 3 one of the pistons will be pushed forward and by means of the two armed lever 8 at the same time the other piston is pushed backward, thus obtaining a continuous reciprocating movement of the pistons.

Each of the cylinders 12 is provided with a duct 10 through which the viscose is admitted and is forced to the proper place.

As will be readily understood with this known type of viscose pump it is necessary to fill the chamber 6 with a lubricant, as the pistons slide continuously along the guiding block and must therefore be copiously lubricated as well as the heads of the two armed levers which preferably are not connected with the pistons by bolts or the like but are also sliding in slots of the piston heads. To avoid transport of the oil along the piston or transport of viscose from the pressure space during the pressure movement the piston carrier is provided with a slot or cut at r so that a complete interruption of the cylinder walls of the pistons 2 results with a corresponding space or chamber slotted into the carrier near the end of the piston carrier facing the reciprocating mechanism of the pistons. The space or chamber r is widely open (Fig. 2) to allow easy inspection and cleaning preferably with a tool of hook shape that is capable to enter behind the pistons to remove the waste substance that may collect therein.

Preferably the casing is also provided at this place with openings 7 of suitable width. Through these openings easy escape of the waste matter penetrating into said chambers during the working of the pump is facilitated. A suitable width will also secure easy inspection and facilitate the introduction of the cleaning tool that may be necessary to clean said chamber whenever the mixture solidifies or forms incrustations that do not leave the chambers by gravity of their own accord.

What I claim is:

1. In a pump for spinning liquids liable to solidification such as viscose comprising pistons and a piston carrier provided with bores acting as working cylinders for said pistons, a casing surrounding said pistons and piston carrier, a driving mechanism for said pistons within said casing, chambers arranged within said piston carrier, each chamber surrounding said piston and being provided with a flaring wide opening towards said casing and said casing being provided with openings adapted to correspond with said openings of the chambers so as to secure permanent easy communications with said chamber and inspection of the same from without.

2. In a pump for spinning liquids liable to solidification such as viscose, a piston, a cylinder, driving members for said piston, a chamber surrounding said piston and interrupting the walls of said cylinder, said chamber being located between the working space of said cylinder and said driving members, and adapted to collect liquid creeping along the piston from the working space and from the driving mechanism, said chamber having a wide and flaring opening against the outside allowing easy discharge of the liquid liable to soldification and easy cleaning and inspection.

In testimony whereof I affix my signature.

GUSTAV NEMETZ.