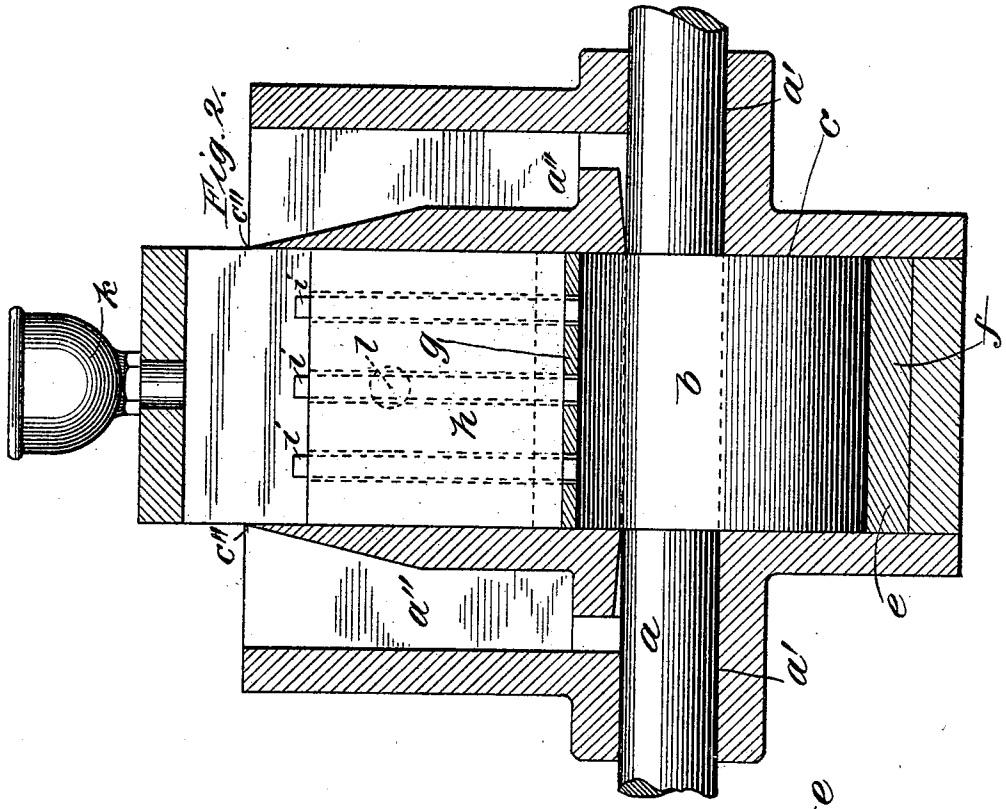
No. 623,605. Patented Apr. 25, 1899.

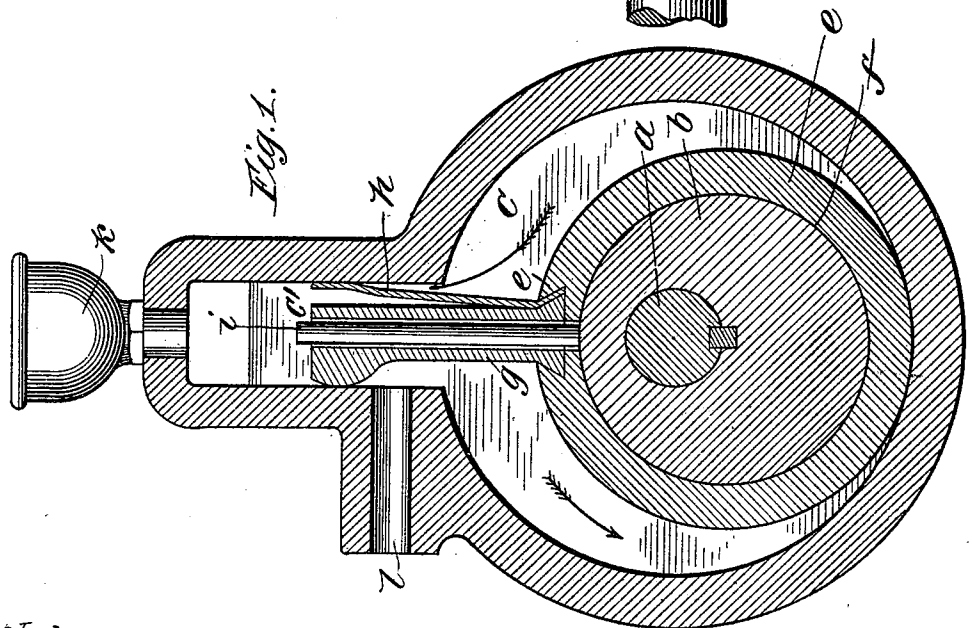
E. W. G. C. HOFFMANN.

ROTARY PUMP.

(Application filed Apr. 1, 1898.)

(No Model.)





Witnesses:
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UNITED STATES PATENT OFFICE.

ERNST WILHELM GUSTAV CARL HOFFMANN, OF CHARLOTTENBURG, GERMANY, ASSIGNOR TO THE SIEMENS & HALSKE ELECTRIC COMPANY OF AMERICA, OF CHICAGO, ILLINOIS.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 623,605, dated April 25, 1899.

Application filed April 1, 1898. Serial No. 676,081. (No model.)

To all whom it may concern:

Be it known that I, ERNST WILHELM GUSTAV CARL HOFFMANN, a subject of the Emperor of Germany, residing at Charlottenburg, Germany, have invented a certain new and useful Improvement in Rotary Pumps, (Case No. 149,) of which the following is a full, clear, concise, and exact description.

My invention relates to improvements in rotary pumps, and has for its object the provision of means for securing a more efficient pumping or exhausting action than has been attainable hitherto in pumps of this class. It has been found in practice difficult or well nigh impossible to secure any considerable rarefaction of air or other gas when rotary pumps were employed as exhausters, and I have accordingly devised means for obviating this defect. The reason for the unsatisfactory operation above alluded to is that means have not been devised previously for insuring in a pump of this class a packing that is sufficiently tight or close fitting to secure the necessary rarefaction when the pump is in action.

I will describe my invention as applied to a type of rotary eccentric pump wherein my improved lubricating packing is employed. This type of pump may be briefly characterized as consisting of an eccentric pump part rotatably mounted upon the driving-shaft within the exhaust-chamber, with which chamber and pump part are associated means for insuring free lubrication of the said parts, whereby a highly-efficient exhausting action is secured.

The above device, in connection with which I will now explain my invention, will be more readily understood by reference to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a transverse sectional view of said pump, and Fig. 2 is a longitudinal sectional view thereof.

The same letters of reference are used to designate like parts in both of said figures.

Power is supplied to the driving-shaft *a*, upon which is keyed or otherwise secured the eccentric *b*, mounted within the exhaust or pump chamber *c*. The pump housing or casing *d* provides end bearings *a' a'*, wherein the said shaft is rotatably mounted. Upon the eccentric *b* is disposed the ring or cylindrical pump part *e*, within which said eccentric is free to rotate, the two parts forming an eccentric-piston *f*. Mounted upon the upper side of said ring is the upright *g*, having its head rounded, which is adapted at all times to be maintained in close engagement with the left wall of the supplemental chamber *c'* by means of a spring-like tongue *h*, also mounted upon the ring *e* and bearing against the right-hand wall of said chamber. The upright *g* is centrally bored to receive the three rods *i*, which loosely fit within their respective openings in said upright.

It will be understood that the several movable pump parts mounted within the housing fit quite closely the walls of their respective chambers. On the upper part of said housing is mounted the oil-cup *k*, and from supplemental chamber *c'* oil-overflows *c''* permit the oil to pass into the wells *a''*, disposed upon either side of and communicating with the exhaust-chamber *c*. The inlet or exhausting pipe *l* opens into the chamber *c* beneath the head of the upright *g*.

The operation of the pump will now be readily comprehended. The parts within the exhaust-chamber having been previously thoroughly lubricated and the wells *a''* being partially filled with oil, the rotation of the shaft and eccentric in a contra-clockwise direction will serve to exhaust the air within the chamber *c* and through the communicating inlet *l*. The surplus oil within the chamber will be pressed upward with the air into the supplemental chamber *c'* and pass the spring or tongue *h*, which readily permits the upward passage of the oil and air and serves as a valve to prevent their return. The spring or tongue maintaining the upright in close engagement with the left wall of the chamber prevents the entrance of air to the left side of the exhaust-chamber. The surplus oil in the supplemental chamber will pass through the overflows and into the wells *a''*, from which it returns to the exhaust-chamber and maintains the packing between the moving parts and the walls of said chamber, being forced therein through the bearings by reason of the

vacuum produced in the said exhaust-chamber. The oil is also forced downward through the openings in the upright, the reciprocating movement of said part serving to move up and down the rods *i*, which are loosely fitted in the said openings, and force the oil between the eccentric and its encircling ring, from whence it passes to the sides of the eccentric, thus assisting in maintaining the parts sufficiently lubricated. For convenience the oil may be supplied to the device, when desired, by means of the oil-cup *k*. The pressure of the external air, it will be seen, materially assists the passage of oil through the several communicating openings to the exhaust-chamber.

From the above it will be seen that in the normal operation of the pump the complete circulation of the oil will be maintained, which secures at all times for the device a very high efficiency. A very thick or heavy oil preferably is employed in the rotary pump above described, although other fluid packing or heavy lubricants may be found efficient for some applications of said pump.

Various modifications or departures from the device herein described may be made without departing from the spirit of my invention.

I accordingly claim as new, and desire to secure by Letters Patent, the following:

1. In a device of the class described, the combination with an exhaust-chamber, of a rotary pump part or piston disposed therein, a receptacle for a lubricant or fluid packing connected with the exhaust-chamber adapted to supply oil to the pump parts, and an overflow or return passage connected with the discharge-opening of the pump, whereby the lubricant or fluid packing is circulated and freely supplied to the relatively-moving parts, substantially as described.

2. In a rotary pump, the combination with the exhaust-chamber *c*, of the eccentric-piston *f* mounted therein upon an actuating-shaft *a*, an upright *g* adapted to maintain the exhaust-chamber closed to the external air, oil-overflow *c''*, and a well *a''* communicating therewith and with the exhaust-chamber, whereby a fluid packing or lubricant is circulated and freely supplied to the relatively-movable pump parts, substantially as described.

3. In a pump of the class described, the combination with an exhaust-chamber *c*, of an eccentric-piston *f* mounted therein upon an actuating-shaft *a*, an upright *g* provided with rods *i* loosely mounted in openings in said upright and adapted to assist in lubricating the connected piston, a valve part *h*, oil-overflows *c''*, and lubricating-receptacles *a''* communicating with the said overflows and with the exhaust-chamber, whereby a fluid packing or lubricant is circulated within the pump and freely supplied to the relatively-movable pump parts, substantially as described.

In witness whereof I hereunto subscribe my name this 7th day of March, A. D. 1898.

ERNST WILHELM GUSTAV CARL HOFFMANN.

Witnesses:

PAUL ROEDIGER,

C. H. DAY.