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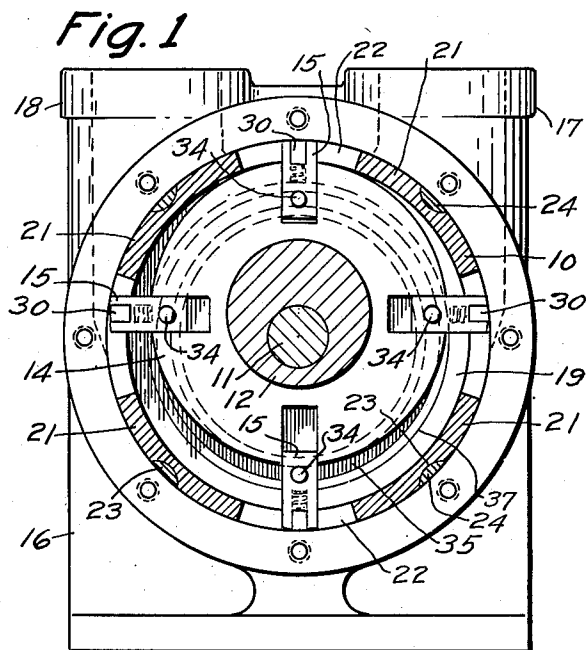
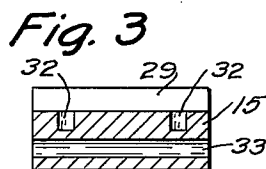
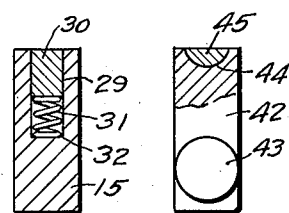
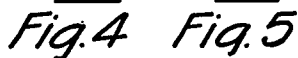
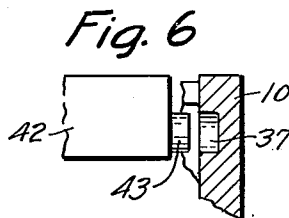
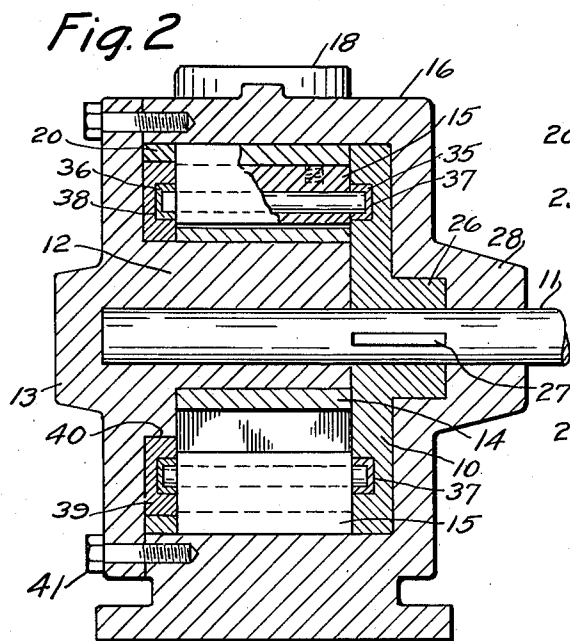
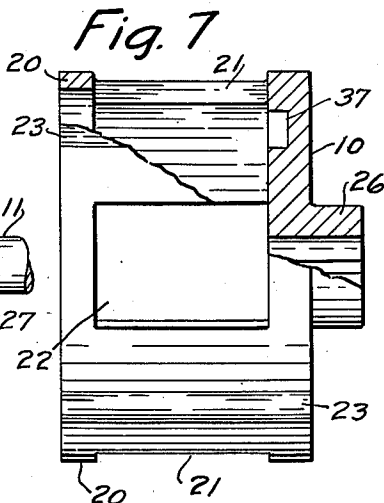
F. SCOGNAMILLO

2,590,132

ROTOR CYLINDER ROTARY DEVICE

Filed April 15, 1949

2 SHEETS—SHEET 1



Inventor

FRANK SCOGNAMILLO

By

James Harrison Bowen

ATTORNEY

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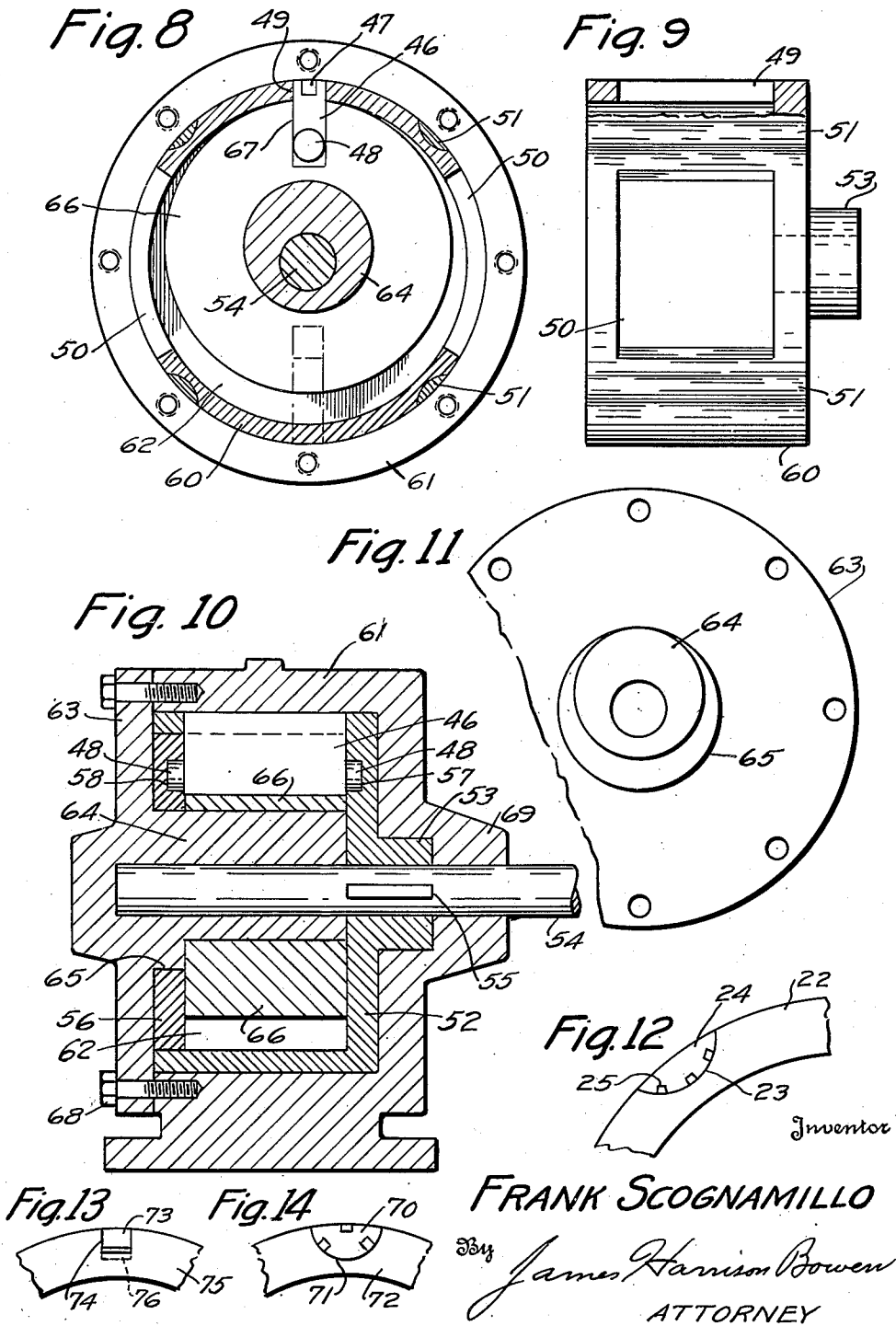
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ROTOR CYLINDER ROTARY DEVICE

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2 SHEETS—SHEET 2



UNITED STATES PATENT OFFICE

2,590,132

ROTOR CYLINDER ROTARY DEVICE

Frank Scognamillo, Bronx, N. Y., assignor to
Scognamillo Engineering Company, New York,
N. Y., a company of New York

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4 Claims. (Cl. 103—121)

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This invention relates to rotary devices of the freely floating rotor type wherein the blade or blades are driven by surface contact against the outer edges and the function of the rotor is to provide a guide for holding the blades in radially disposed positions, and in particular the invention relates to a rotary device having an inner rotor cylinder keyed to a driving shaft and having a slot or slots to receive the blade or blades in which blades are maintained in wiping contact with the inner surface of a cylindrical rotor chamber and travel through a fixed crescent-shaped area in the chamber.

The purpose of this invention is to provide a rotary device, such as a pump, engine, compressor, or the like having a blade or blades in an eccentrically positioned floating rotor in which the driving force that carries the blade or blades around is applied continuously along the outer edge of the blade and against one side thereof.

This invention is an improvement over the rotary pump of the former Patent No. 2,443,994 of my father, Salvatore Scognamillo, deceased, and also of copending applications of my father and myself, which with the above-noted patent have been assigned to the Scognamillo Engineering Company, to which this application is also assigned by an assignment filed herewith. The improvement being in the fact that blades are directly driven by their outer edges with a rotor cylinder carried by a driving shaft and enclosing a freely rotatable eccentrically positioned rotor in a cylindrical rotor chamber and wherein the rotor maintains the blades in radially disposed positions.

The object of this invention is, therefore, to improve the efficiency of rotary devices by applying a driving force directly against the side of a blade whereby friction resulting from the blade rubbing against the sides of a blade carrying slot is substantially eliminated.

Another object of the invention is to provide means for driving a blade of a rotary device along the outer instead of the inner edge of the blade.

Another object of the invention is to provide sealing means in the outer surface of a rotor cylinder of a rotary device wherein the said rotor cylinder actuates blades of the device.

A further object of the invention is to provide a rotary device in which blades thereof are driven by a force applied to the outer edges of the blades which is of a simple and economical construction.

With these and other objects and advantages in view the invention embodies a rotary device having a cylindrical rotor chamber in a

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housing with inlet and outlet connections, with a rotor eccentrically positioned and freely mounted on a stationary core in the chamber and with blades radially positioned in the rotor extended through and driven by the peripheral wall of a rotor cylinder concentrically positioned in the chamber and carried by a driving shaft journaled in the housing.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:

Figure 1 is an elevational view looking toward the open end of the housing of a rotary device with the rotor cylinder, core, and shaft shown in section.

Figure 2 is a longitudinal section through the rotary device with parts broken away and parts in section.

Figure 3 is a detail showing a longitudinal section through one of the blades.

Figure 4 is cross section through the blade of the type shown in Figures 1 and 3, with the section taken through one of the spring sockets.

Figure 5 is an end view of a blade of a modified design wherein a cylindrical head is provided at the end of the blade, and part of the blade is broken away showing a semi circular sealing strip in the edge thereof.

Figure 6 is a detail showing the end of the blade shown in Figure 5 with part of the rotor cylinder shown in section and with parts broken away.

Figure 7 is an elevational view of the rotor cylinder with part broken away and part shown in section.

Figure 8 is an end elevational view similar to that shown in Figure 1 with parts omitted, and showing a modification wherein a single blade is positioned with the outer edge thereof held in a slot in the rotor cylinder.

Figure 9 is a side elevational view of the rotor cylinder illustrated in the design shown in Figure 8 with part broken away and shown in section.

Figure 10 is a longitudinal section through the device shown in Figure 8.

Figure 11 is an elevational view looking toward the inside of the cover plate of the housing showing the core and shoulder therein.

Figure 12 is a detail showing the lubricating grooves in the sealing strips of the rotor cylinder with parts of the cylinder broken away.

Figure 13 is a detail showing a rectangular-shaped blade in the outer surface of the rotor cylinder with springs under the blade.

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Figure 14 shows a substantially semi-circular blade in a slot in the outer peripheral surface of a rotor cylinder.

Referring now to the drawings wherein like reference characters denote corresponding parts the rotary device of this invention includes a rotor cylinder 10 keyed to a shaft 11, an eccentrically positioned core 12 on a cover plate 13, a floating rotor 14, a blade 15, and a housing 16 with an inlet connection 17 and an outlet connection 18, and having a cylindrical rotor chamber 19 therein, said housing being made up, as shown, of the spaced end walls, one of them the cover 13, connected by the cylindrical peripheral wall having the inlet and outlet connections therein.

The rotor cylinder 10 is formed with a flange having a cylindrical wall with ports therein extended from the outer edge, and the wall is formed with an outer ring 20 and with sections 21 connecting the ring to the flange. Between the sections or segments 21 are orifices 22 and in the outer surfaces of the segments are recesses 23 in which sealing or packing strips 24 are positioned. Although the strips 24 are shown substantially semi-circular, it will be understood that they may be rectangular-shaped, as shown in Figure 13, or of any suitable shape, and the contacting surfaces thereof may be provided with grooves 25, too small to be shown in Fig. 1 but shown in detail in Fig. 12, in which graphite or other lubricating material may be placed. The flange 10 is provided with a hub 26 through which it is keyed by a key 27 to the shaft 11. The shaft is journaled in the core 12 and the hub 28 of the housing.

The blade 15 is provided with a longitudinally disposed slot 29 in which an inner blade or wearing strip 30 is positioned and the strip 30 is urged outwardly by springs 31 in openings 32 in the blade. The blade is also provided with a bore 33 in which a pin 34 is positioned, and the ends of the pins of the blades extend into rings 35 and 36, which are channel-shape in cross section, as shown in Figure 2. The ring 35 is positioned in an annular groove 37 in the inner surface of the flange 10 of the rotor cylinder, and the ring 36 is positioned in an annular groove 38 in a disc 39 that is recessed in the outer end of the rotor cylinder. The disc 39 travels on a shoulder 40 of the cover plate 13 and the core 12 extends from the shoulder. The cover plate is secured to the end of the housing by bolts 41.

In the design shown in Figures 5 and 6 a blade 42 is provided with a cylindrical head 43 at each end and the heads extend directly into grooves 37 and 38 of the rotor cylinder and disc, respectively. The outer wiping edge of the blade is formed with a recess 44 in which a wearing strip 45 is positioned which provides continuous sealing contact with the inner peripheral surface of the cylindrical rotor chamber.

In the design shown in Figures 8, 9, and 10, a single blade 46, similar to the blade 42, is shown, and this is provided with a wearing strip 47 and has cylindrical heads 48 at the ends. The rotor cylinder is provided with a single slot 49 through which the edge of the blade extends, and openings 50 are also provided in the sides with sealing strips 51 in the outer surface. The cylinder is carried by and integral with a flange 52 on a hub 53. The cylinder is keyed to a shaft 54 by a key 55, and the outer end of the cylinder is provided with a disc 56.

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In this design the heads 48 of the blade 46 are positioned in cylindrical sockets 57 and 58 in the rotor cylinder flange 52 and disc 56, respectively, and it will be understood that although the heads are shown integral with the blade a pin extending through the blade, as illustrated in Figures 1 to 3, may be used.

The rotor cylinder, as indicated by the numeral 60, is mounted in a housing 61 having a rotor chamber 62 therein, and the housing is provided with a cover plate 63 that carries a core 64 and a shoulder 65. The disc 56 is rotatably mounted on the shoulder 65, and a rotor 66 is freely rotatable on the core 64, the rotor being provided with a blade slot 67. The cover plate is attached to the housing by bolts 68 and the shaft is journaled in the core 64 and in a hub 69 of the housing.

With the outer edge of the blade extended into a continuous slot of a rotor cylinder of this type the blade is driven by or actuates the rotor cylinder with continuously contacting surfaces throughout the length of the blade, and the floating rotor functions, as a guide maintaining the blade or blades in radially disposed position, with the blades remaining in wiping contact with the inner peripheral surface of the rotor chamber.

The blades 24 positioned or cradled in blind slots in the outer peripheral surface of the rotor cylinder not only increase the sealing efficiency but also act as suction blades. These blades may be made of bronze, steel, or other suitable material, and may be of arcuate form, as shown in Figure 12, or semi-circular blades 70, as shown in Figure 14, may be used with the blades in grooves 71 of a cylinder 72, or the blades may be rectangular-shaped, as shown in Figure 13, in which blades 73 are shown in grooves 74 in a cylinder 75. The blades 73 shown in Figure 13 are resiliently urged outwardly by springs 76, so that they will be positively held in wiping contact with the wall of the surrounding chamber. The spring or springs may be used in the other designs, and it will also be understood that the blades in the grooves of the rotor cylinder will be held in continuous wiping contact with the surrounding surface by centrifugal force resulting from the travel of the blades in the device.

It will be understood that other modifications may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. A rotary device of the character disclosed comprising a housing having spaced end walls connected by a cylindrical peripheral wall forming a cylindrical chamber, said housing having spaced inlet and outlet ports opening into said chamber, a cylindrical core projecting from one end wall toward the opposite end wall and disposed eccentrically of the cylindrical chamber, a shaft journaled in the opposite end wall and in said cylindrical core in concentric relation to said cylindrical chamber, a cylindrical rotor carried by said shaft and in rotary running engagement with the peripheral wall of said chamber, said cylindrical rotor having slots therein, a floating rotor journaled on said eccentrically disposed cylindrical core and in running engagement with the inner periphery of said cylindrical rotor at a point between the inlet and outlet ports, and a blade seated in sliding engagement in said floating rotor and projecting through one of the slots in the cylindrical rotor

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into wiping contact with the cylindrical peripheral wall of the chamber.

2. A rotary device of the character disclosed comprising a housing having spaced end walls connected by a cylindrical peripheral wall forming a cylindrical chamber, said housing having spaced inlet and outlet ports opening into said chamber, a cylindrical core projecting from one end wall toward the opposite end wall and disposed eccentrically of the cylindrical chamber, a shaft journaled in the opposite end wall and in said cylindrical core in concentric relation to said cylindrical chamber, a cylindrical rotor carried by said shaft and in rotary running engagement with the peripheral wall of said chamber, said cylindrical rotor having slots therein, a floating rotor journaled on said eccentrically disposed cylindrical core and in running engagement with the inner periphery of said cylindrical rotor at a point between the inlet and outlet ports, a blade seated in sliding engagement in said floating rotor and projecting through one of the slots in the cylindrical rotor into wiping contact with the cylindrical peripheral wall of the chamber and packing strips seated in the outer surface of the cylindrical rotor between the slots therein in running, sealing engagement with the peripheral wall of the chamber.

3. A rotary device of the character disclosed comprising a housing having spaced end walls connected by a cylindrical peripheral wall forming a cylindrical chamber, said housing having spaced inlet and outlet ports opening into said chamber, a cylindrical core projecting from one end wall toward the opposite end wall and disposed eccentrically of the cylindrical chamber, a shaft journaled in the opposite end wall and in said cylindrical core in concentric relation to said cylindrical chamber, a cylindrical rotor carried by said shaft and in rotary running engagement with the peripheral wall of said chamber, said cylindrical rotor having slots therein, a floating rotor journaled on said eccentrically disposed cylindrical core and in running engagement with the inner periphery of said cylindrical rotor at a point between the inlet and outlet ports, a blade seated in sliding engagement in said floating rotor and projecting through one of the slots in the cylindrical rotor into wiping contact with the cylindrical peripheral wall of the chamber and packing strips seated in the outer surface of the cylindrical rotor between

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the slots therein in running, sealing engagement with the peripheral wall of the chamber, said packing strips having lubricant holding grooves therein.

4. A rotary device of the character disclosed comprising a housing having spaced end walls connected by a cylindrical peripheral wall forming a cylindrical chamber, said housing having spaced inlet and outlet ports opening into said chamber, a cylindrical core projecting from one end wall toward the opposite end wall and disposed eccentrically of the cylindrical chamber, a shaft journaled in the opposite end wall and in said cylindrical core in concentric relation to said cylindrical chamber, a cylindrical rotor carried by said shaft and in rotary running engagement with the peripheral wall of said chamber, said cylindrical rotor having slots therein, a floating rotor journaled on said eccentrically disposed cylindrical core and in running engagement with the inner periphery of said cylindrical rotor at a point between the inlet and outlet ports, and a blade seated in sliding engagement in said floating rotor and projecting through one of the slots in the cylindrical rotor into wiping contact with the cylindrical peripheral wall of the chamber, said blade having projections on the ends of the same and guiding means within the cylindrical chamber engaging said projections on the ends of the blade to hold the blade outward in running engagement with the cylindrical peripheral wall of the chamber.

FRANK SCOGNAMILLO.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
395,647	Bailey	Jan. 1, 1889
930,403	Mooney	Aug. 10, 1909
1,154,645	McGonigle	Sept. 28, 1915
1,671,399	Brady	May 29, 1928
2,029,554	Berggren	Feb. 4, 1936
2,266,191	Granberg	Dec. 16, 1941
2,443,994	Scognamillo	June 22, 1948

FOREIGN PATENTS

Number	Country	Date
60,561	Norway	Mar. 13, 1939
441,339	Great Britain	Jan. 17, 1936