United States Patent

[11] 3,628,898

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[45] Patented **Dec. 21, 1971**

[54] **TWIN ELLIPSE PUMP**
3 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** **418/45**
[51] **Int. Cl.** **F01c 5/00**, F03c 3/00, F04c 5/00
[50] **Field of Search** 417/477, 476, 475; 92/132; 418/45, 205, 206, 156, 153

[56] **References Cited**

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ABSTRACT: In the new and improved pump disclosed herein, a pair of counterrotating crossed arms of unequal lengths are respectively rotatably mounted in the center of a pair of semicylindrical overlapping chambers. Rollers on the outer ends of each of the arms are rollingly engaged within a resilient elliptically shaped band disposed around the walls of each chamber and resiliently coengaged with the other band at a point midway between the two chambers to separate a common fluid inlet and outlet. Each pair of the arms has one longer arm with an overall length substantially equal to the diameter of the chambers so that counterrotation of the arms will move the rollers on the longer arms around the bands to press successive portions of the bands against the adjacent cylinder walls for forming progressively advancing fluid displacement spaces around the perimeter of the cylinders to conduct fluids from the inlet to the outlet.

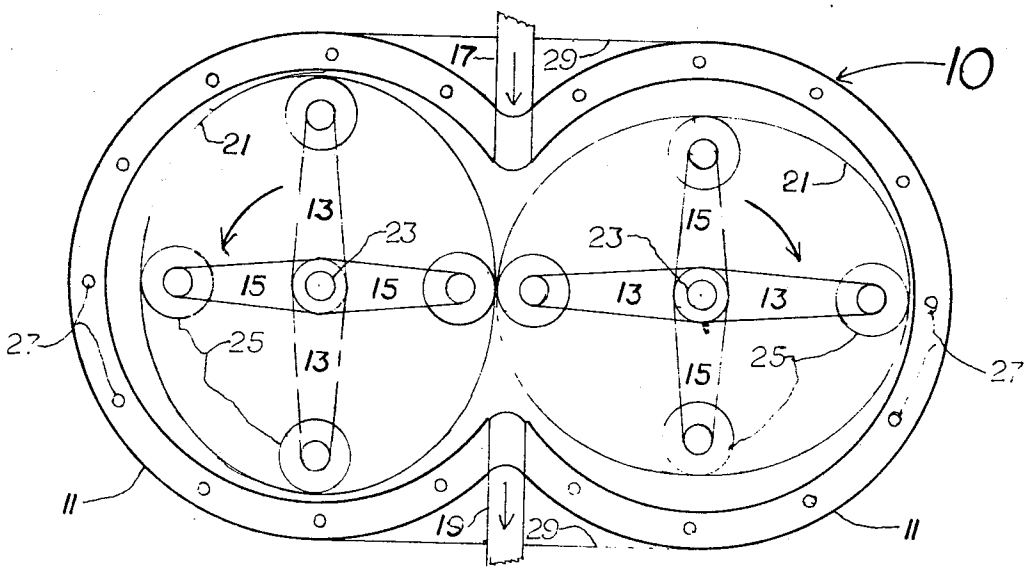

FIG. 1

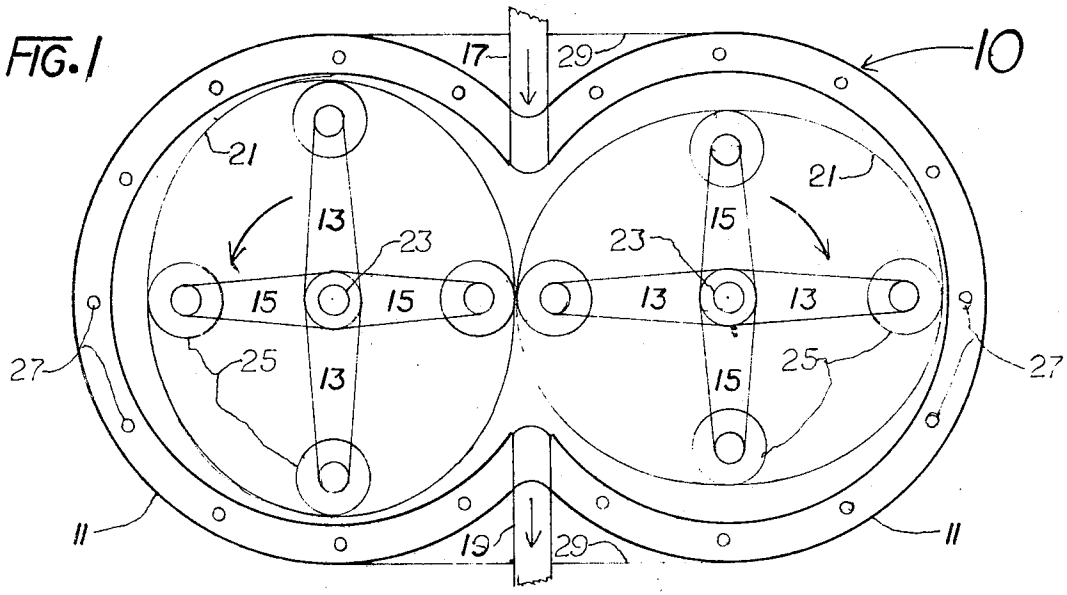

FIG. 2

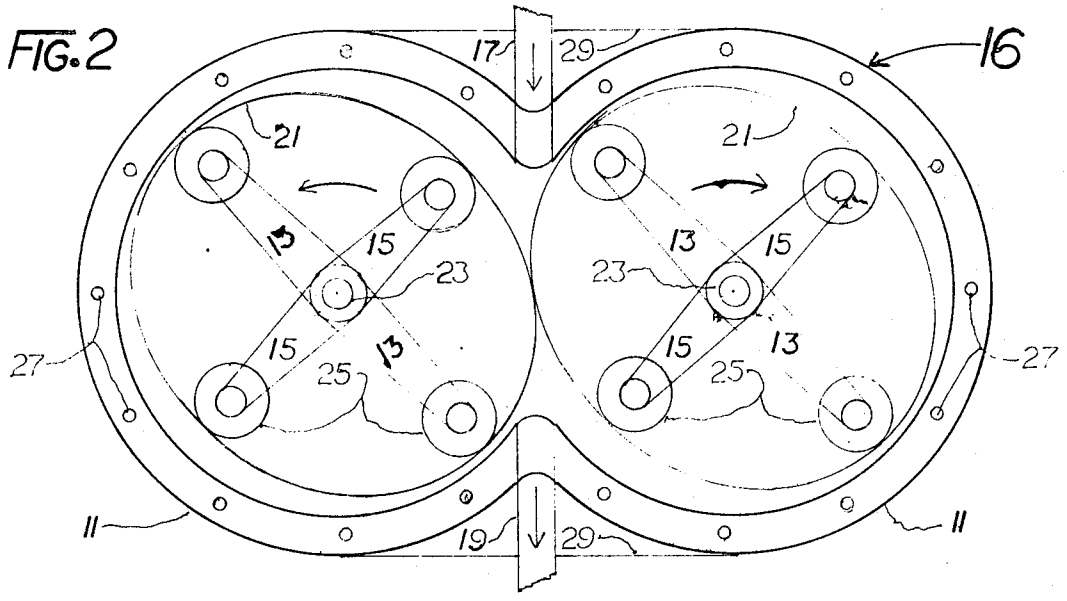

FIG. 3

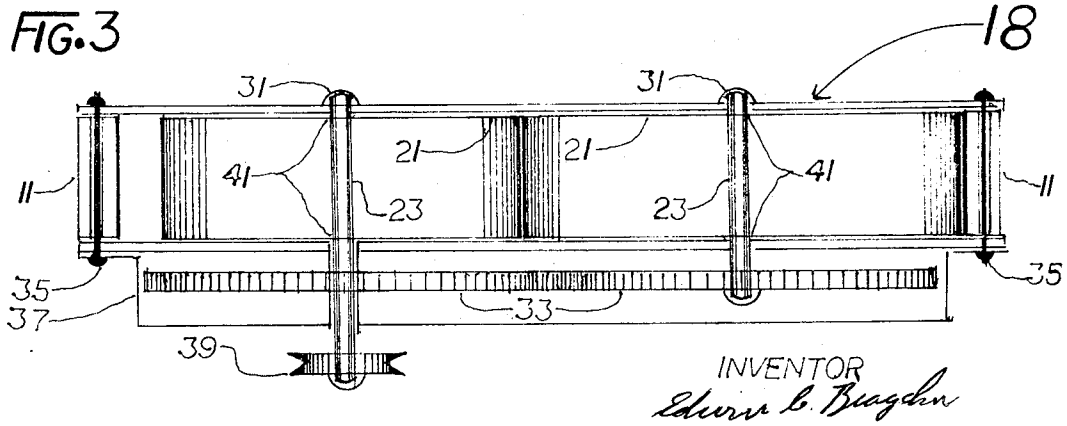

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FIG. 4

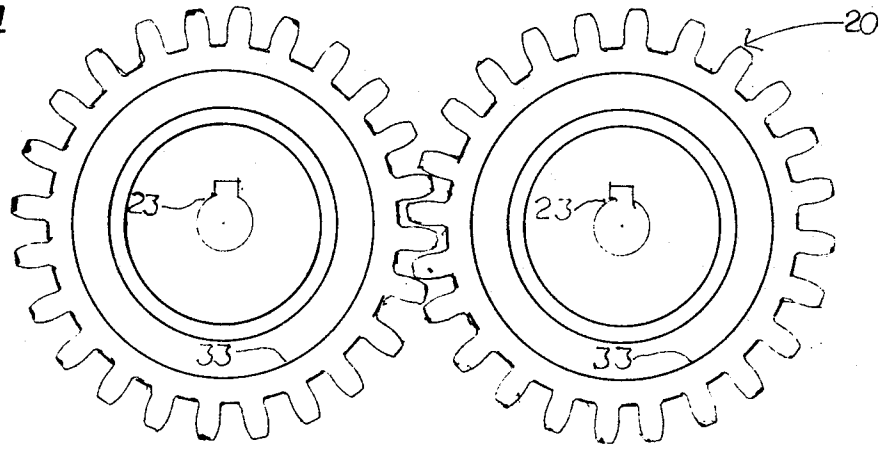


FIG. 5

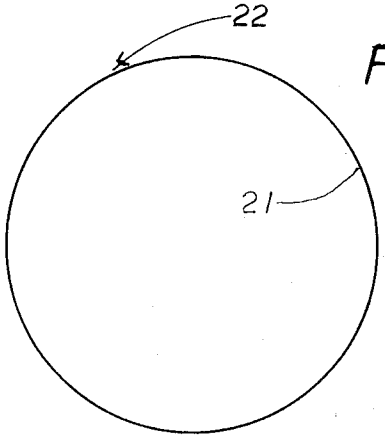


FIG. 6

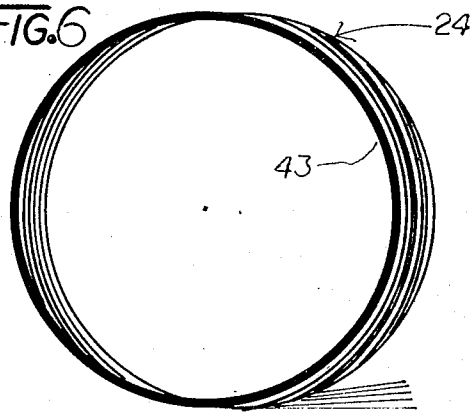


FIG. 7

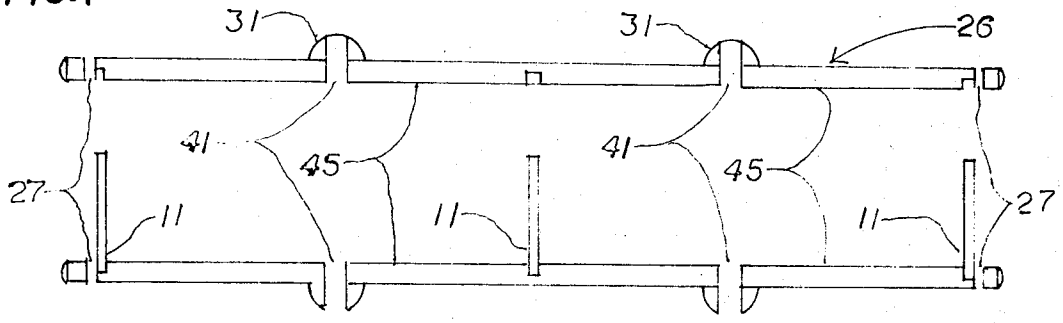


FIG. 8

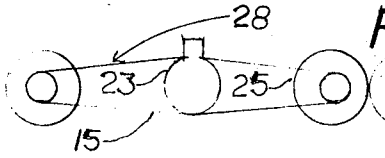
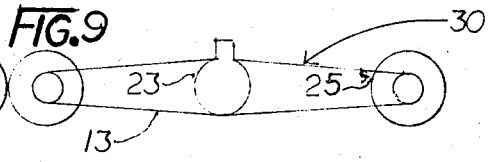


FIG. 9



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TWIN ELLIPSE PUMP

This invention relates to pumps, and more particularly to new and improved pumps adapted to deliver a soft even flow without creating pockets and crevices to stagnate materials.

It is therefore the main purpose of this invention to provide a pump for all types of liquids, gas or air.

Other objects of this present invention are to provide a pump which is simple in design, inexpensive to manufacture rugged in construction, easy to use and efficient in operation.

These and other objects will become readily evident upon a study of the following specification and the accompanying drawings wherein:

FIG. 1 is a top view with top and bottom housing plates removed from a preferred embodiment of the present invention;

FIG. 2 is same as FIG. 1 except that portions of the depicted pump have been advanced;

FIG. 3 is a horizontal side view of the pump shown in FIG. 1;

FIG. 4 shows a set of gears used to drive the pump of the present invention;

FIG. 5 shows a steel impeller band employed in the present invention;

FIG. 6 depicts a conventional rubber band or tire to fit over the steel band shown in FIG. 5 of the drawings;

FIG. 7 a horizontal side view of the top and bottom housing plates for used for the pump shown in FIG. 1;

FIGS. 8 and 9 show the rotatable arms and rollers employed for the pump of the present invention.

According to this invention, a twin ellipse pump 10 is shown in FIGS. 1 and 2 to include a hub 23 to which is attached two pairs of perpendicularly crossed arms which are arranged in two side-by-side semicylindrical chambers and have their outer ends respectively attached to rollers 25 forming an ellipse 21.

The outer housing 11 has bolt holes to secure top and bottom plates 45.

The flow lines 17 and 19 may be reversed with precisely the same efficiency.

Looking now at FIG. 3 of the drawing 18 one will see a horizontal view of FIG. 1, showing shafts 23 top and bottom housing plates 45, top bearing oil boxings 31, gears 33, oil pan 37, bolts 35, bearings 41 and power pulley 39.

In FIG. 4 in drawings 20 there are two gears 33 and hubs 23.

In FIG. 5 of drawing 22 is a round spring steel band 21 to be sprung into an ellipse shown in FIG. 1.

FIG. 6 shows a rubber seal band 43 which may be optional to use with band 21 for a seal to eliminate close tolerances.

FIG. 7 shows the top and bottom housing plates 45, bearings 41, bolt holes 27, bearing 41, bolt holes 27, bearing housing 31 and outer housing 11.

Now what I claim is:

1. A rotary pump comprising: a housing having an inlet and outlet on opposite sides thereof and having first and second semicylindrical chambers on opposite sides thereof and disposed in an overlapping relationship; first and second rotors cooperatively arranged side-by-side for rotation in said first and second chambers respectively, each of said rotors comprised of a longer arm perpendicularly intersected with a shorter arm, and a plurality of rollers respectively mounted on the outer ends of said arms, the rollers on said longer arms being positioned thereon for rotation in a circular path substantially adjacent to the walls of their respective chamber and the rollers on said first shorter arms being positioned thereon for rotation in a circular path of lesser diameter approaching tangential intersection with the circular path of lesser diameter of said rollers on said second shorter arms; first and second endless resilient bands of a substantially elliptical configuration respectively arranged around said rollers of said first and second rotors and adapted for being progressively pressed against said chamber walls as said rollers on said longer arms are successively rollingly engaged around said bands upon counter rotation of rotors in their respective chamber portions for trapping fluids between said chamber walls and said bands and progressively forcing such trapped fluids from said inlet to said outlet, said first and second bands being engaged with one another at about the tangential intersection of said circular paths of lesser diameter for blocking direct fluid communication between said inlet and said outlet; and first and second means coupled to said first and second rotors and adapted for counter rotating said rotors.

2. The rotary pump of claim 1 wherein said first and second bands are formed of metal.

3. The rotary pump of claim 1 wherein said first and second bands are formed of rubber.

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