

- [54] **DRIVE SYSTEM FOR A PLURALITY OF WORM DRIVEN COMPRESSORS**
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- [58] Field of Search **417/319, 429; 415/122, 123; 74/665 G, 665 GA, 665 GB, 665 GC, 665 GD, 665 GE; 418/69, 209, 270, 199, 201**

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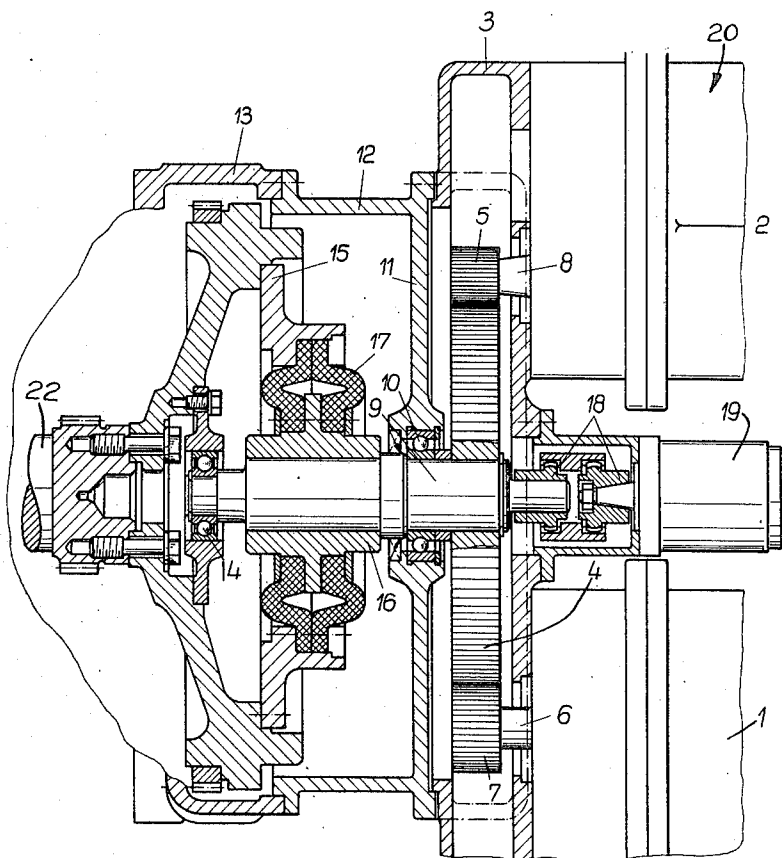
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[57] ABSTRACT

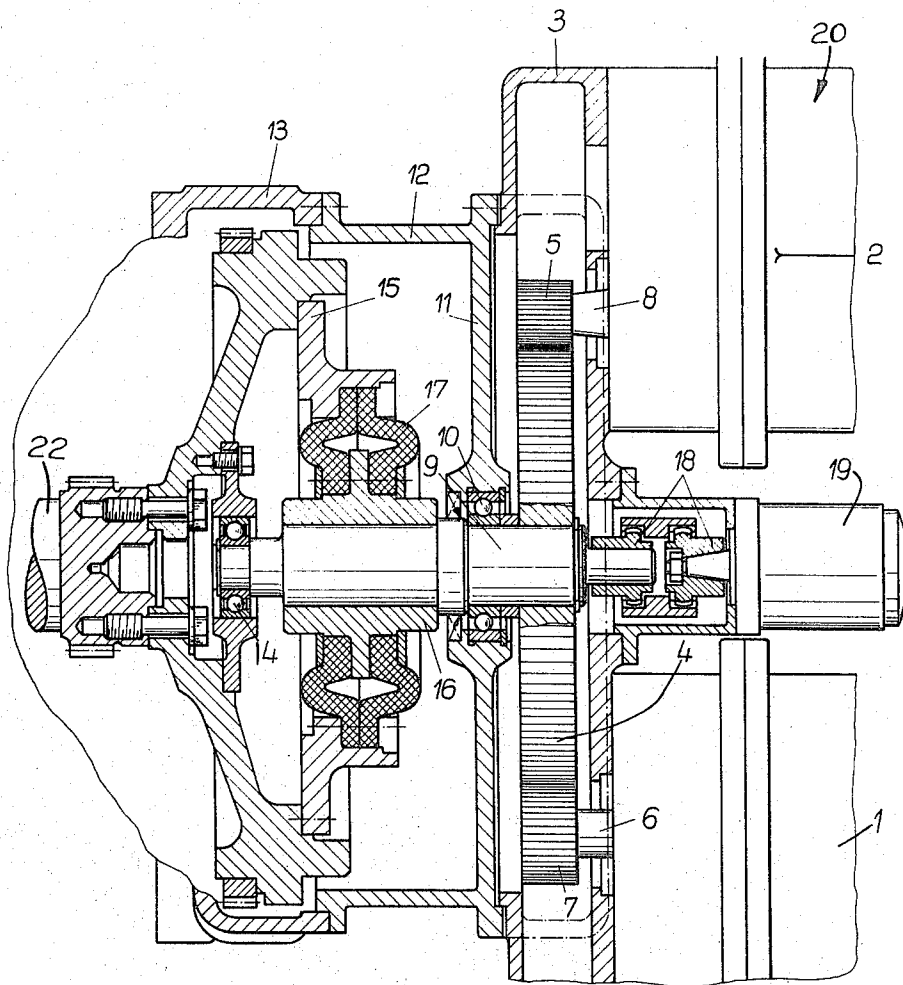
A worm compressor system includes at least two parallel worm compressors each having a worm shaft with a gear which is driven from a centrally arranged gear of a main shaft. The main shaft is supported in a bearing carried on a wall member closing the transmission gear housing of the two compressors, and constituting a component of a housing part having an opposite end connected to the flange of a driving motor. The main drive shaft extends through this bearing and has a free end in the transmission gear housing carrying the centrally arranged gear in a cantilever fashion. The opposite end of the main shaft is received in a bearing mounted in the flywheel of the driving motor, and a coupling connects the flywheel to the main shaft between the two bearings. A pump has a drive shaft coaxially aligned with the free inner end of the main shaft and connected thereto by a spline-type coupling.

3 Claims, 1 Drawing Figure



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DRIVE SYSTEM FOR A PLURALITY OF WORM DRIVEN COMPRESSORS

This is a continuation, of application, Ser. No. 30,819 filed Apr. 22, 1970.

SUMMARY OF THE INVENTION

This invention relates in general to a drive arrangement, particularly for compressors and in particular to a new and useful arrangement of worm-driven compressors which are operated from a common driving motor which is connected by a coupling with a main driving shaft which is connected by gears to drive a plurality of the compressors.

It is known to double-mount the central main drive shaft in the transmission gear housing for driving compressors. The two bearings are arranged on the compressor side spaced from each other in a separate main bearing housing. On the side of the drive shaft opposite these bearings, there is a coupling connection to the driving motor. The motor-driven main gear wheel is arranged between the coupling and the drive shaft bearings.

In accordance with the invention, it has been found that a separate main bearing housing for the bearings of the main drive shaft can be eliminated, and that there can be provided a bearing system utilizing the flywheel of the driving motor.

In the drive arrangement of the invention, a main driving gear which is affixed to a main driving shaft is located to engage a plurality of driven gears for operating a plurality of compressors. The main driving gear is supported on an over-hung portion of the shaft and the shaft is supported by a bearing in the partition wall of an extension affixed to the housing of the compressors and by a bearing carried by the flywheel of the driving motor. The intermediate wall forms a cover for the connection extending between the flywheel and the gearing for driving the compressor. A coupling is arranged on the main drive shaft between the flywheel of the motor and the gear on the main shaft which drives the individual worm gears of the individual compressors. The coupling is thus supported between the bearings supporting the shaft and provides a coupling for interconnecting the motor flywheel with the driving gear for the compressors. For such a construction, a housing which surrounds only the coupling and serves as an intermediate member between the motor flange and the gear housing, and which is required in any event, also provides a supporting function. The flange or supporting wall receives the main supporting bearing on the side of the transmission gear opposite to the worm compressor gears. The bearing at the opposite end of the main shaft can be designed as a pure guide bearing since it is arranged in a rotating flywheel.

The exact installation of the various parts of the drive mechanism, which must be axially aligned relative to each other, is possible with the inventive arrangement without any difficulties due to the selected construction. The central axially aligned position of the main drive shaft and of the parts connected to the driving motor, such as the drive shaft, the flywheel, the motor flange, and the motor coupling etc., are maintained even when one or the other or all of the compressor stages must be removed together with the transmission gear. Preferably, an oil pump is connected through an

additional coupling to the end of the drive shaft which is remote from the bearing.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference should be had to the accompanying drawing and descriptive matter in which there is illustrated a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The only FIGURE of the drawing is a partial axial sectional view of a compressor system constructed in accordance with the invention.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing in particular, the invention embodied therein comprises a compressor system generally designated 20 which includes individual worm driven compressors 1 and 2 having a common housing portion 3 at one end. The housing portion 3 forms an extension at one end of the compressors 1 and 2, which covers a main gear 4 which is affixed to a main drive shaft 9 and which is in meshing engagement with one or more pinions, for the number of compressors which are involved, namely pinions 5 and 7 for the compressors 2 and 1, respectively. The gears 5 and 7 are affixed to worm shafts 8 and 6, respectively. The shafts 8 and 6 are worm rotors of the compressors 2 and 1, respectively.

In accordance with a feature of the invention, a main driving gear 4 is mounted on an overhung portion of the main shaft 9 and the main shaft is rotatably supported adjacent this end on an anti-friction bearing 10 which is carried in a partition wall 11 of an extension part 12 which is bolted to the housing 3. The extension part 12 also supports a motor flange housing part 13 which covers a flywheel 15 carried on a motor drive shaft 22 which is rotated by a driving motor (not shown). The main drive shaft 9, in accordance with a further feature of the invention, is rotatably supported on an anti-friction bearing 14 which is carried centrally within the flywheel 15. The bearing 14 can be designed as a pure guide bearing.

In accordance with a still further feature of the invention, a motor coupling 17 is arranged on main drive shaft 9 between bearings 10 and 14. Coupling 17 is secured to a hub portion or sleeve 16 on shaft 9 and is also secured with the motor flywheel as indicated at 15.

An oil pump 19 is advantageously arranged at the overhung portion of the shaft 9 and it is connected through a spline coupling 18 to this end of the main drive shaft 9.

What is claimed is:

1. In a worm compressor plant having at least two worm compressors, with parallel axes, having respective drive gears driven by a common driving gear, the gears being arranged in a transmission gear housing and the common driving gear being secured to a central main drive shaft rotatably mounted in axially spaced bearings and coupled to a common driving motor having a flywheel: the improvement comprising said motor having a motor drive shaft, coaxial with said main drive shaft, and with an end spaced axially from an adjacent end of said main drive shaft; said flywheel being

mounted on said end of said motor drive shaft; said motor including a motor housing having an annular flange adjacent said end of said motor drive shaft; a cylindrical housing part having one open end connected peripherally to said motor housing flange and a partition wall at the other end, spaced axially from said one open end, forming the cover of said transmission gear housing; said housing part serving as an intermediate member between said motor flange and said transmission gear housing; a main bearing arranged in said partition wall; said main drive shaft extending through said main bearing and having a free end within said transmission gear housing, and said common driving gear being secured to said free end of said main drive shaft within said transmission gear housing; a second bearing mounted in said flywheel and receiving that opposite end of said main drive shaft which is spaced axially from the end of said motor drive shaft carrying said flywheel; and a coupling connecting said flywheel to said main drive shaft intermediate said main and second bearings; whereby said housing part surrounds only said coupling and further provides a support for said main drive shaft, and whereby an accurate mounting of the individual components of said worm compressor plant, with proper axial alignment, may be readily and

easily attained; the axially aligned relations of said main drive shaft, said motor drive shaft, said flywheel, said motor flange and said coupling being maintained even when one or more of said compressors with the associated respective drive gears must be dismantled.

2. In a worm compressor plant, the improvement claimed in claim 1, including a pump adjacent the free end of said main drive shaft and having a pump drive shaft coaxial with said main drive shaft, and a pump coupling connecting said main drive shaft to said main pump drive shaft for driving said pump.

3. In a worm compressor plant, the improvement claimed in claim 1, including a plurality of individual worm compressors arranged around said common driving gear and each having a worm shaft with a respective drive gear thereon engaged with said common driving gear, said transmission gear housing enclosing said common driving gear and all of said compressor drive gears, said housing part including an axially extending circumferential wall substantially concentric with said main drive shaft, and said partition wall comprising an annular wall extending radially inwardly from said circumferential wall with said first bearing being arranged centrally of said partition wall.

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