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*MEM "FaVi/NC2019-0000714" /XPN /APID

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RU2013115021 A	Horizontal multistage composite rotary pump unit and method of its assembly	NEFTEKAMSK MACHINERY PLANT
US20090246039 A1	Carrier assembly for a pump	GRUNDFOS
EP2074330 A1	Multistage pump assembly	GRUNDFOS
EP-662196 A1	Sectional-casing-design rotary pump	SIHI
FR2535412 A1	Suction stage of a centrifugal pump has a plurality of stages	KSB - KLEIN SCHANZLIN & BECKER
US4116583 A	Multi-purpose end casings for ring type multi-stage centrifugal pumps	EDISON INTERNATONAL, ...
DE2614163 B1	Multi-stage centrifugal boiler feed pump - has casing in three sections held together by flanges and studs	HALBERG MASCHINENBAU 6700 LUDWIGSHAFEN
US3963371 A	Multi-stage pump	ROY & ROTH
GB-956731 A	Improvements in or relating to multiple stage centrifugal pumps, compressors or the like	LAVAL TURBINE
FR1234602 A	Centrifugal pump composed of juxtaposed elements	KSB - KLEIN SCHANZLIN & BECKER

Family 1/11 - FAMPAT - ©Questel

Title

(EP3478968)

Ring section pump having intermediate tie rod combination

Publication numbers

RU2019101805

RU2019101805

MX2019000152

CO2019000714

JP2019520515

CL2018003850

EP3478968

CN109642580

BR112018077308

IN201817049005

KR10-2019-0022736

IL263998

AU2017289481

BR112018077308

CA3029397

US20180003177

WO2018/004778

Publication dates

2020-07-29

2020-07-29

2019-08-29

2019-08-20

2019-07-18

2019-07-12

2019-05-08

2019-04-16

2019-04-02

2019-03-15

2019-03-06

2019-01-31

2019-01-24

2019-01-08

2018-01-04

2018-01-04

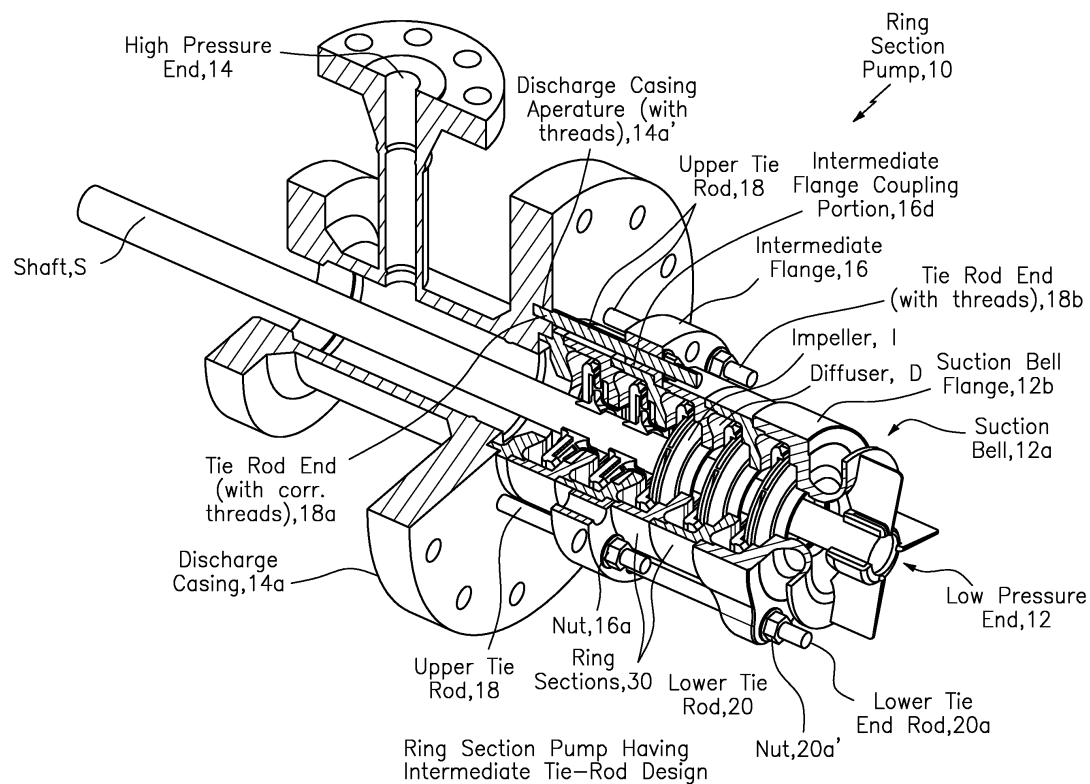
2018-01-04

Abstract

(EP3478968)

A ring section pump features a low-pressure end configured to receive fluid to be pumped into the ring section pump; a high-pressure end configured to provide the fluid to be pumped from the ring section pump; and an intermediate tie rod combination having a intermediate flange with upper tie rods configured to couple together the intermediate flange and the high-pressure end and with lower tie rods configured to couple together the intermediate flange and the low-pressure end. The low-pressure end has an inlet flange; the high-pressure end has an outlet/discharge flange; and the upper tie rods couple together the intermediate flange and the outlet/discharge flange and the lower tie rods couple together the intermediate flange and the inlet flange.

Images



Family 2/11 - FAMPAT - ©Questel

Title

(RU2529979)

Horizontal multistage composite rotary pump unit and method of its assembly

Publication numbers

RU2013115021

RU2529979

Publication dates

2014-10-10

2014-10-10

Abstract

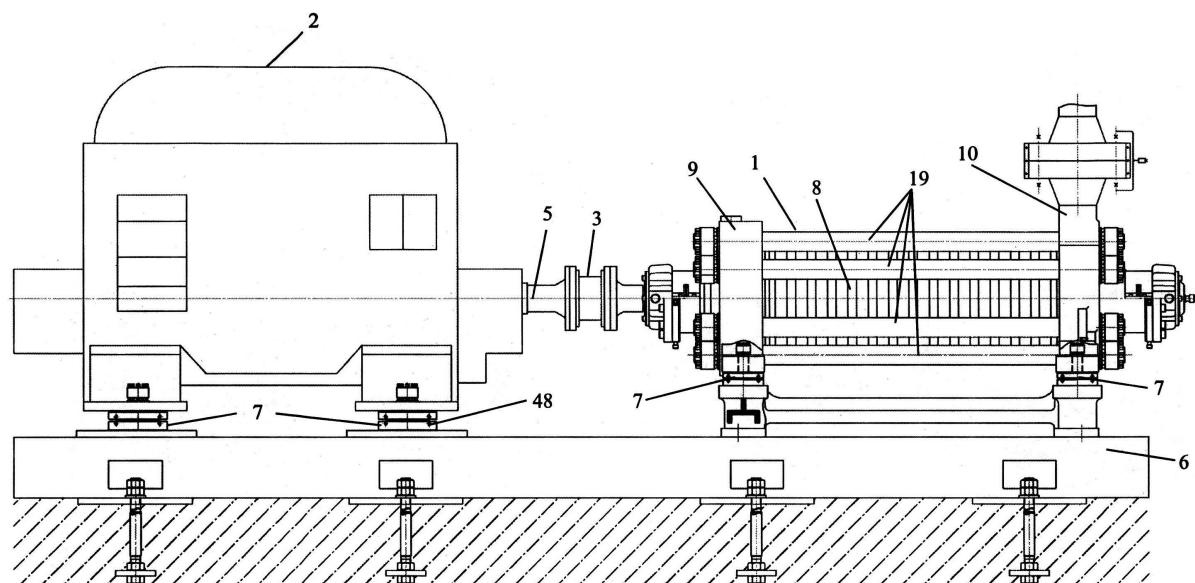
(RU2013115021)

FIELD: engines and pumps.

SUBSTANCE: unit shaft runs in toroidal roller bearings fitted at cantilever supports at end cover outer side. Pump section lock composed of outer tie rods fitted through channels in end covers and arranged uniformly and parallel with shaft axis. Two aligned bushes of balancing device are secured at pressure end cover and balancing device rotor. The latter is fitted on the shaft by means of two-sided collet clamp composed of three coaxial sleeves with contact conical working surfaces and clamping screws. This unit incorporates shaft aligning device while thrust bearings and end seals are fitted on the shaft by means of keyless joints. Motor and pump are mounted at the frame by self-aligning height-adjustable spherical bearings.

EFFECT: higher reliability, lower vibration, decreased noise, lower mounting, servicing and repair costs.

11 cl, 9 dwg

Images

Фиг.1

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Title

(EP2074330)

Multistage pump assembly

Publication numbers

EP2074330

CN101523054

US8172523

US7946810

US20100098531

CN101523054

US20090214332

EP2074330

WO2008/043527

US20080085185

Publication dates

2018-02-21

2013-06-05

2012-05-08

2011-05-24

2010-04-22

2009-09-02

2009-08-27

2009-07-01

2008-04-17

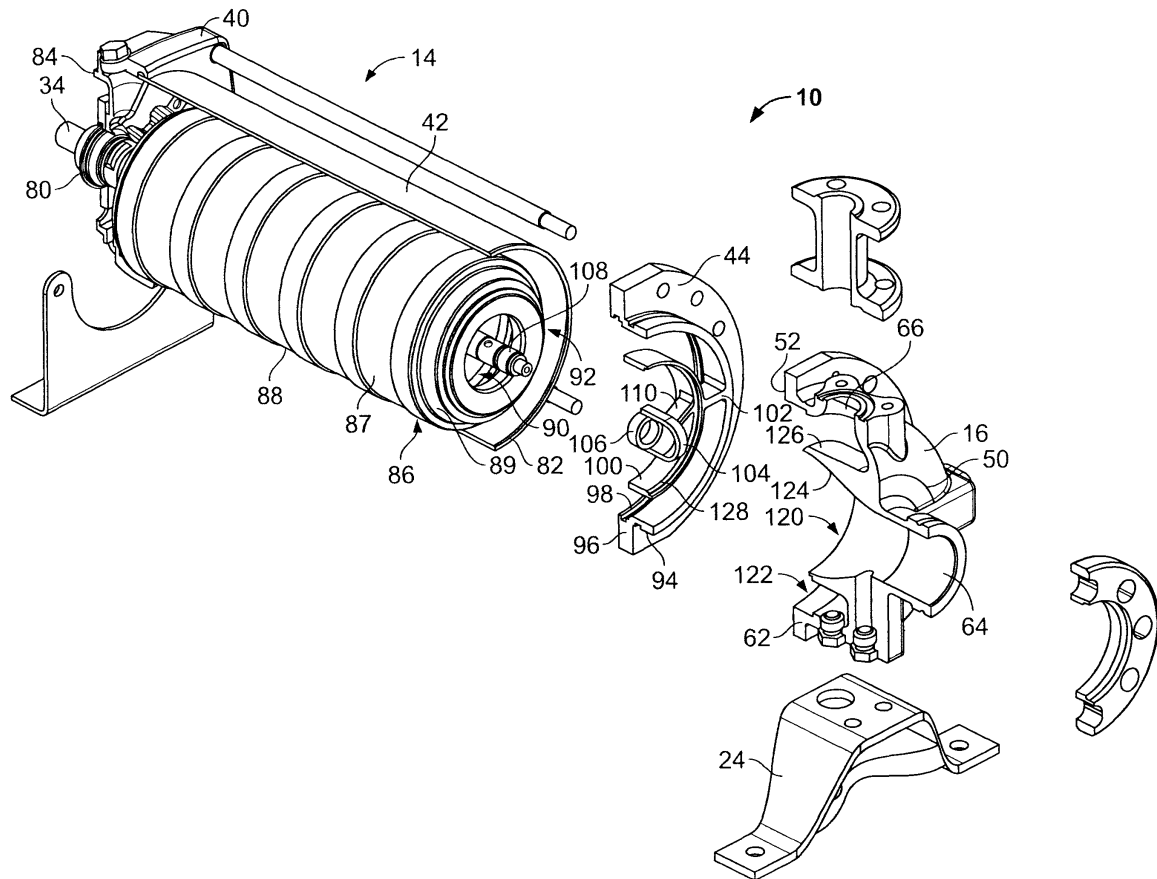
2008-04-10

Abstract

(EP2074330)

The invention refers to a modular pump assembly comprising a volute (16), having a suction chamber (120) and a pressure chamber (122), and a pump stack (14) having at least one stage (86), wherein a modular flange (44) is arranged between the volute (16) and the pump stack (14) and removably coupled to both the pump stack (14) and the volute (16).

Images



Family 5/11 - FAMPAT - ©Questel

Title

(EP-662196)

Sectional-casing-design rotary pump

Publication numbers

FI105126

CA2144443

DK0662196

GR3022695

ES2097540

DE59304838

AT146564

EP0662196

AU672620

US5549450

EP0662196

FI951381

FI951381

AU4818793

CA2144443

DE4232020

WO94/07031

Publication dates

2000-06-15

2000-05-02

1997-06-09

1997-05-31

1997-04-01

1997-01-30

1997-01-15

1996-12-18

1996-10-10

1996-08-27

1995-07-12

1995-03-23

1995-03-23

1994-04-12

1994-03-31

1994-03-31

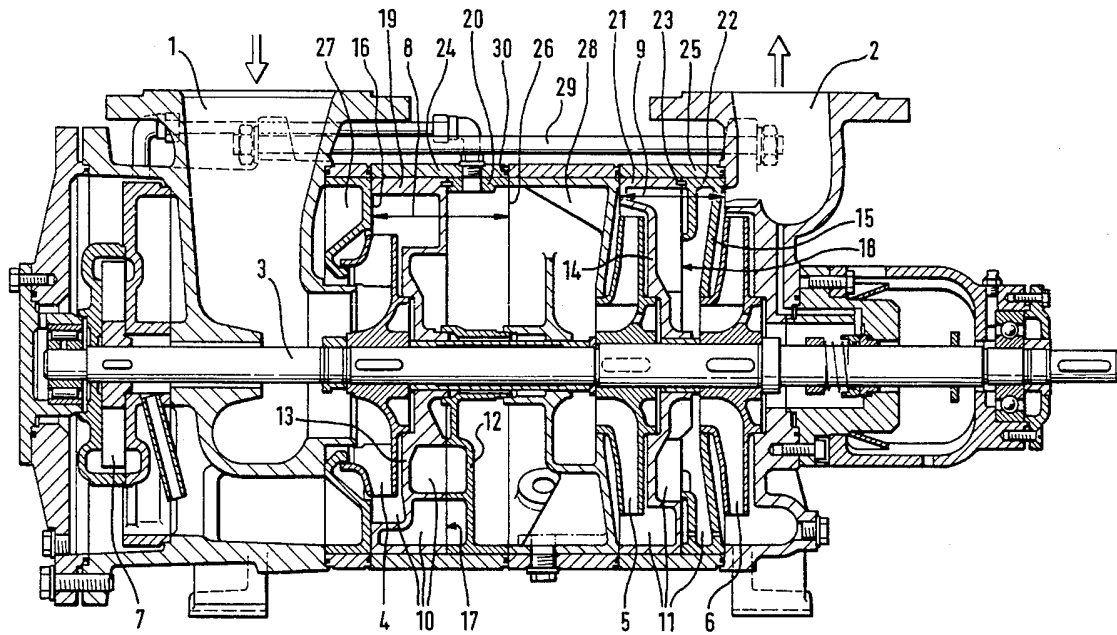
1994-03-31

Abstract

(EP0662196)

Sectional-casing-design rotary pump in which the casing sections (8, 9) have a cylindrical outer casing and internal wall sections (12-15) in one piece therewith. The outer casing of at least one casing component (8, 9) consists of an outer continuous casing component (24, 25) and at least two separate inner casing components (19-22) with the appropriate internal wall sections (12-15). The outer and inner casing components are preferably firmly secured together, especially by shrink-fitting.

Images



Family 6/11 - FAMPAT - ©Questel

Title

(FR2535412)

Suction stage of a centrifugal pump has a plurality of stages

Publication numbers

JPH04103286

IT1169860

GB2129494

FR2535412

JPS5999090

GB2129494

FR2535412

DE3240259

GB8328702

IT8323380

Publication dates

1992-09-07

1987-06-03

1986-10-01

1986-04-18

1984-06-07

1984-05-16

1984-05-04

1984-02-16

1983-11-30

1983-10-20

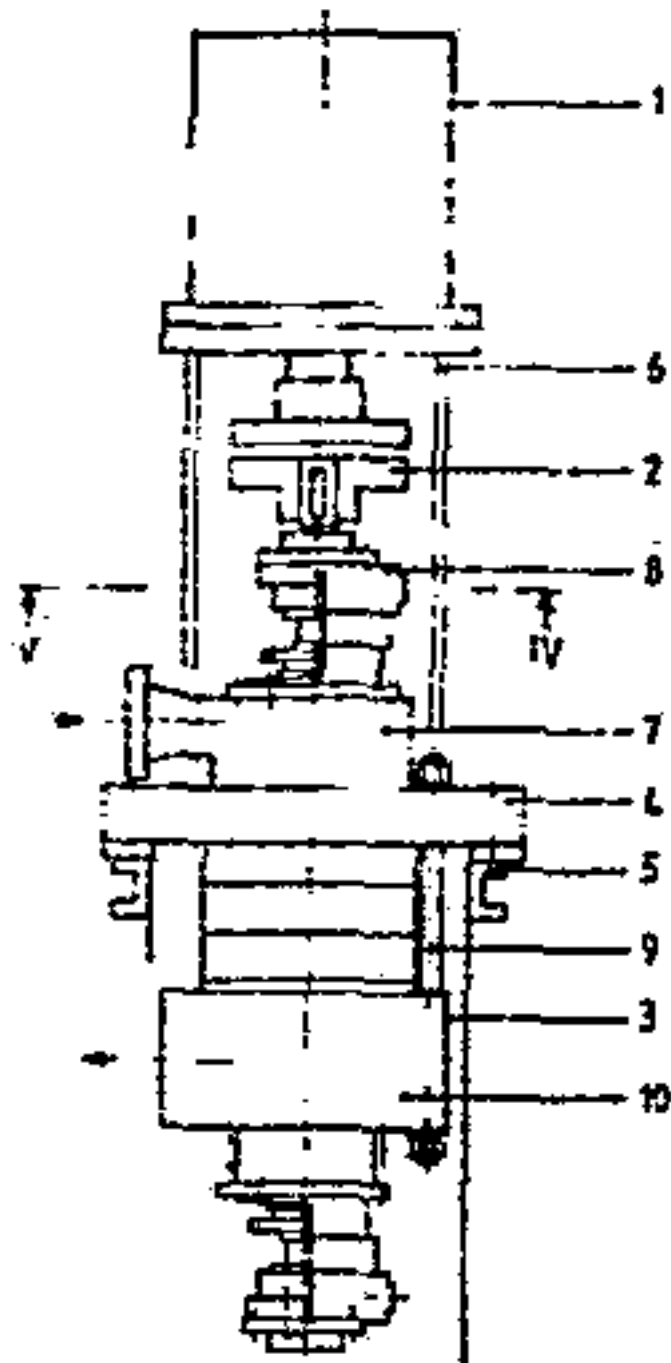
Abstract

(FR2535412)

A casing member 4 of the pump is cut from a steel sheet and has an interior 18 formed by machining. The member is provided with holes 12 through which tie rods 9 pass to clamp the pump stages between an outlet casing 10 and the member. Bolts 15 secure an inlet casing 7 to the member 4. <IMAGE>

(From GB2129494 A)

Images



Family 7/11 - FAMPAT - ©Questel

Title

(US4116583)

Multi-purpose end casings for ring type multi-stage centrifugal pumps

Publication numbers

US4116583

Publication dates

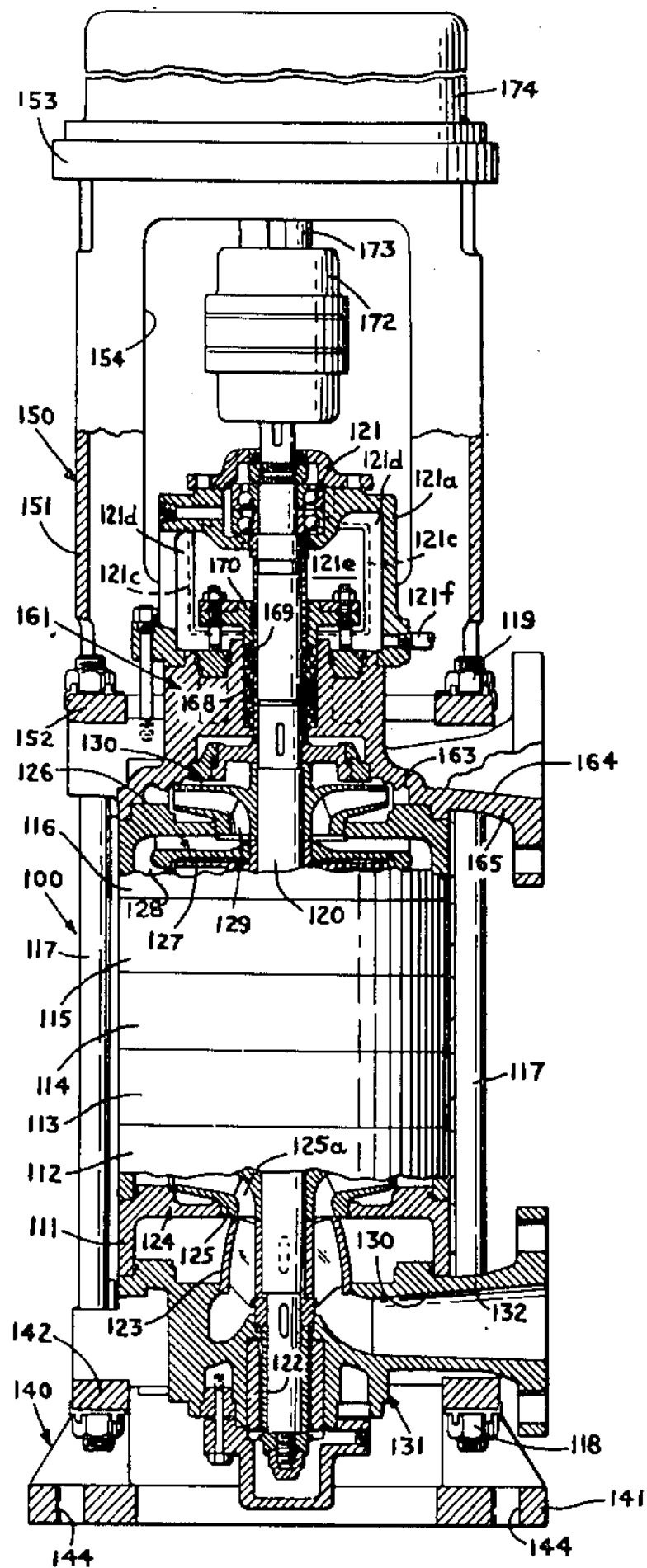
1978-09-26

Abstract

(US4116583)

Multi-purpose end casing for ring type multi-stage centrifugal pumps adaptable respectively for the side suction end casings and side discharge end casings of horizontal, vertical and dry pit side suction multi-stage ring type centrifugal pumps, are disclosed as having a generally cylindrical body portion having at least four tie rod lugs extending therefrom at generally 90 DEG intervals. Each of the tie rod lugs has an ample adapter bearing surface, and a rabbet fitted surface formed thereon to render the same utilizable with a variety of adapters as may be required in different types of pumps on which the end casings are used. Machined, foot mounting surfaces are provided on at least three sides of the respective side suction end casings and side discharge end casings to enable the ready attachment and detachment of pump casing mounting feet. In addition, bearing housings including provision for pump stuffing box leakage collection and drainage are operatively associated with the respective end casings to provide additional versatility.

Images



Family 8/11 - FAMPAT - ©Questel

Title

(DE2614163)

Multi-stage centrifugal boiler feed pump - has casing in three sections held together by flanges and studs

Publication numbers

DE2614163

DE2614163

Publication dates

1977-10-13

1977-03-03

Abstract

(DE2614163)

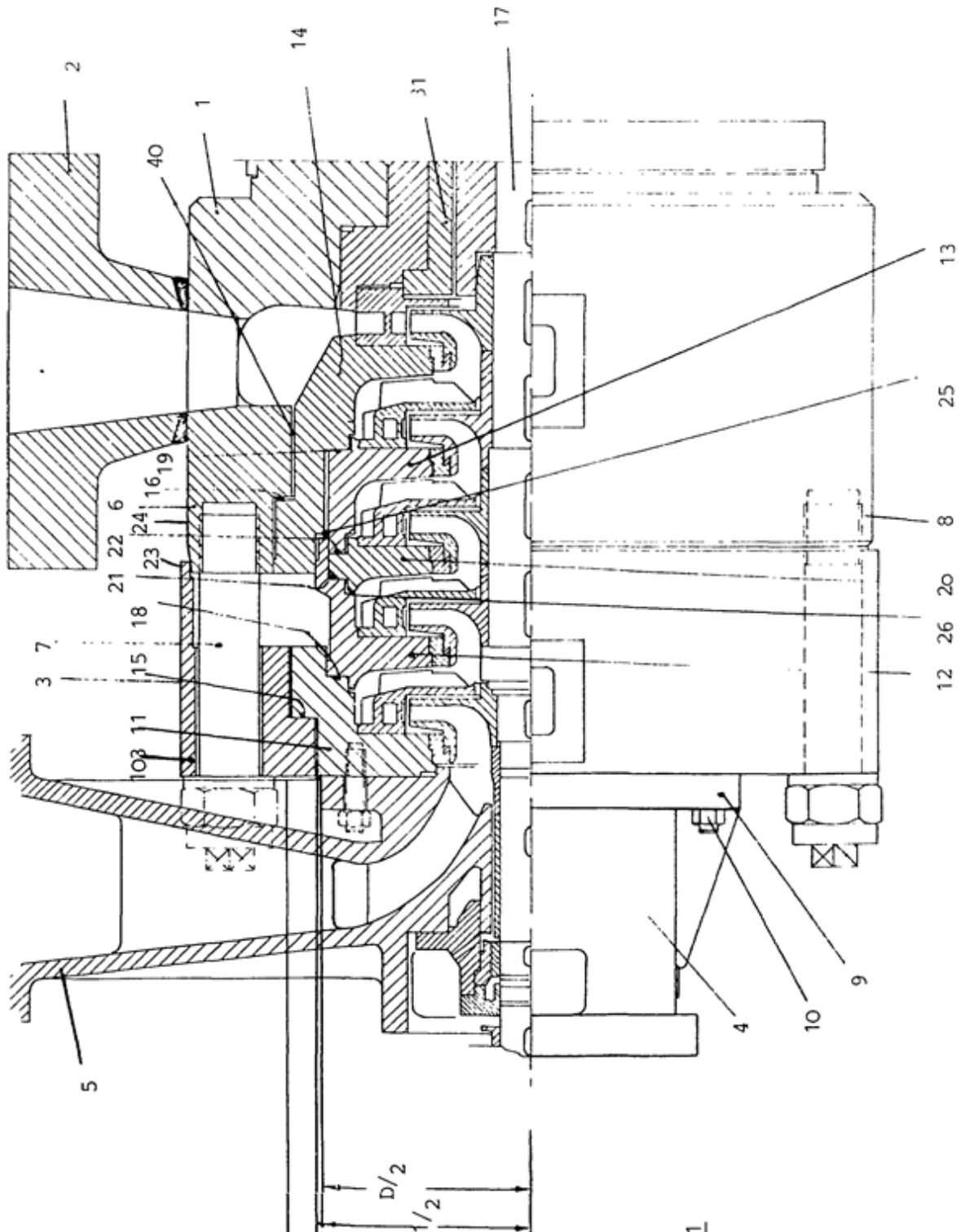
A boiler feed pump has a hollow pot shaped discharge end casing (1) to which the discharge flange (2) can be welded. The several stages are formed by casing rings (11 to 14) which have suitable flanges pressing against each other with sealing rings (18, 21, 22, 25) between them. The stages are surrounded by an intermediate outer casing piece (3) which has a flange (15) pressing against the first stage ring (11). It is held to the discharge end casing piece (1) by studs (7) running through it and screwing into threaded holes in the inner flange (6) of the end piece. The suction end casing piece (4) is attached to the first stage ring by screws. The pump can be readily dismantled in a short space while the discharge end remains connected to the piping.

Images

EICHNUNGEN BLATT 1

2

Nummer: 26 14 163
Int. Cl.²: F04 D 1/06
Bekanntmachungstag: 3. März 1977



Family 9/11 - FAMPAT - ©Questel**Title**

(US3963371)

Multi-stage pump

Publication numbers

DE2602499

JP1198898

JPS5831477

SE425020

IT1052485

CA1063872

GB1506956

GB1506957

GB1506958

ES444155

AU8626375

DE2602499

JPS5214905

NL7513388

SE7600662

US3963371

BE835065

Publication dates

1986-08-07

1984-03-21

1983-07-06

1982-08-23

1981-06-20

1979-10-09

1978-04-12

1978-04-12

1978-04-12

1977-08-01

1977-05-12

1977-02-10

1977-02-04

1977-01-26

1977-01-25

1976-06-15

1976-02-16

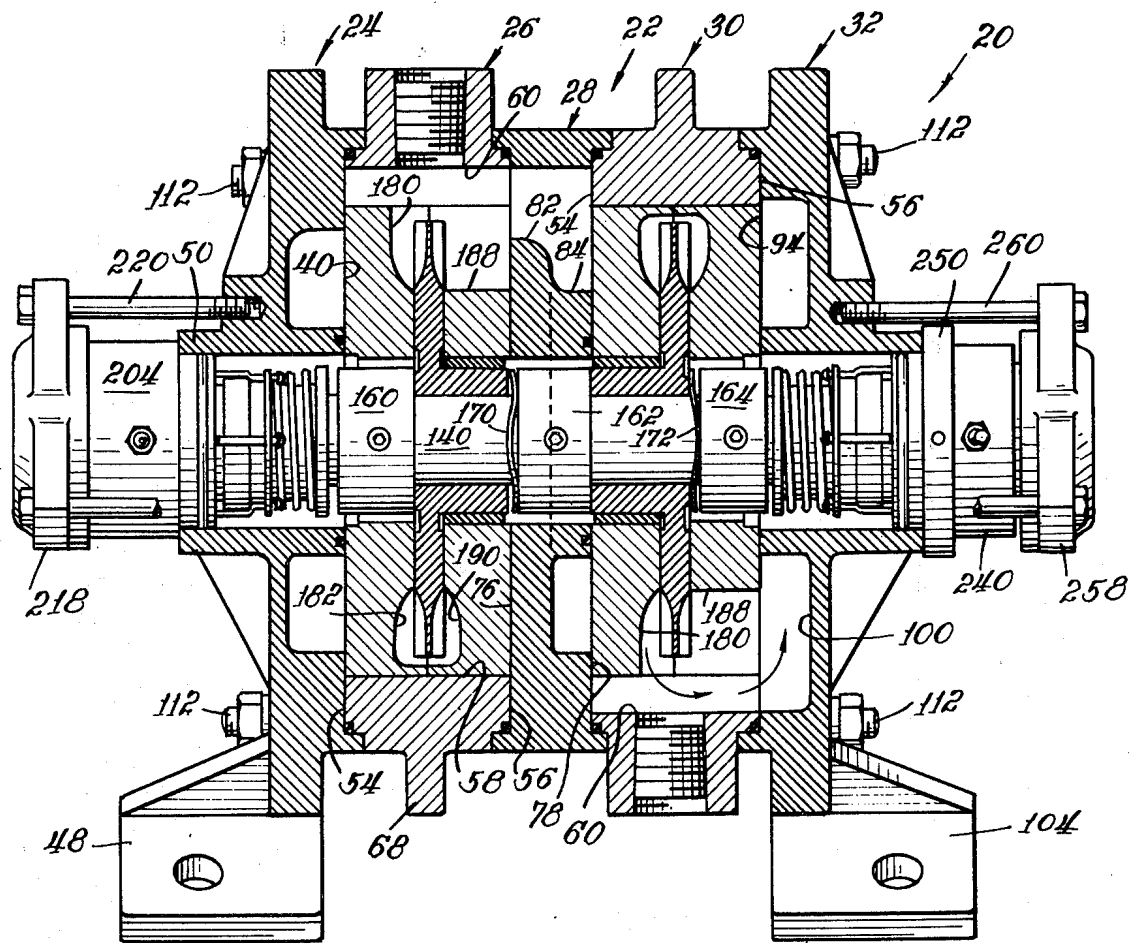
Abstract

(US3963371)

The segmented casing has a plurality of successive stage casing rings, a transfer plate intermediate each adjacent pair of casing rings, a suction end casing section, and a discharge end casing section. A shaft extends axially through the casing, and is supported and sealed at its ends by demountable bearing and seal means. Each casing ring encloses a complete stage containing an impeller which is spring biased into engagement with a locating collar secured to the shaft, and a pair of replaceable liners which are arranged at the opposite sides of each impeller. Each casing ring, impeller, set of liners, locating collar, and spring means, together comprises a module which functions as one stage of the pump. A pump is comprised of two or more modules which are connected internally by a shaft and externally by draw bolts, and which are

contained by the suction and discharge end casing sections. Suction and discharge connections are demountably secured to the casing in any one of several rotative positions.

Images



Family 10/11 - FAMPAT - ©Questel

Title

(GB-956731)

Improvements in or relating to multiple stage centrifugal pumps, compressors or the like

Publication numbers

CH385634

GB956731

Publication dates

1964-12-15

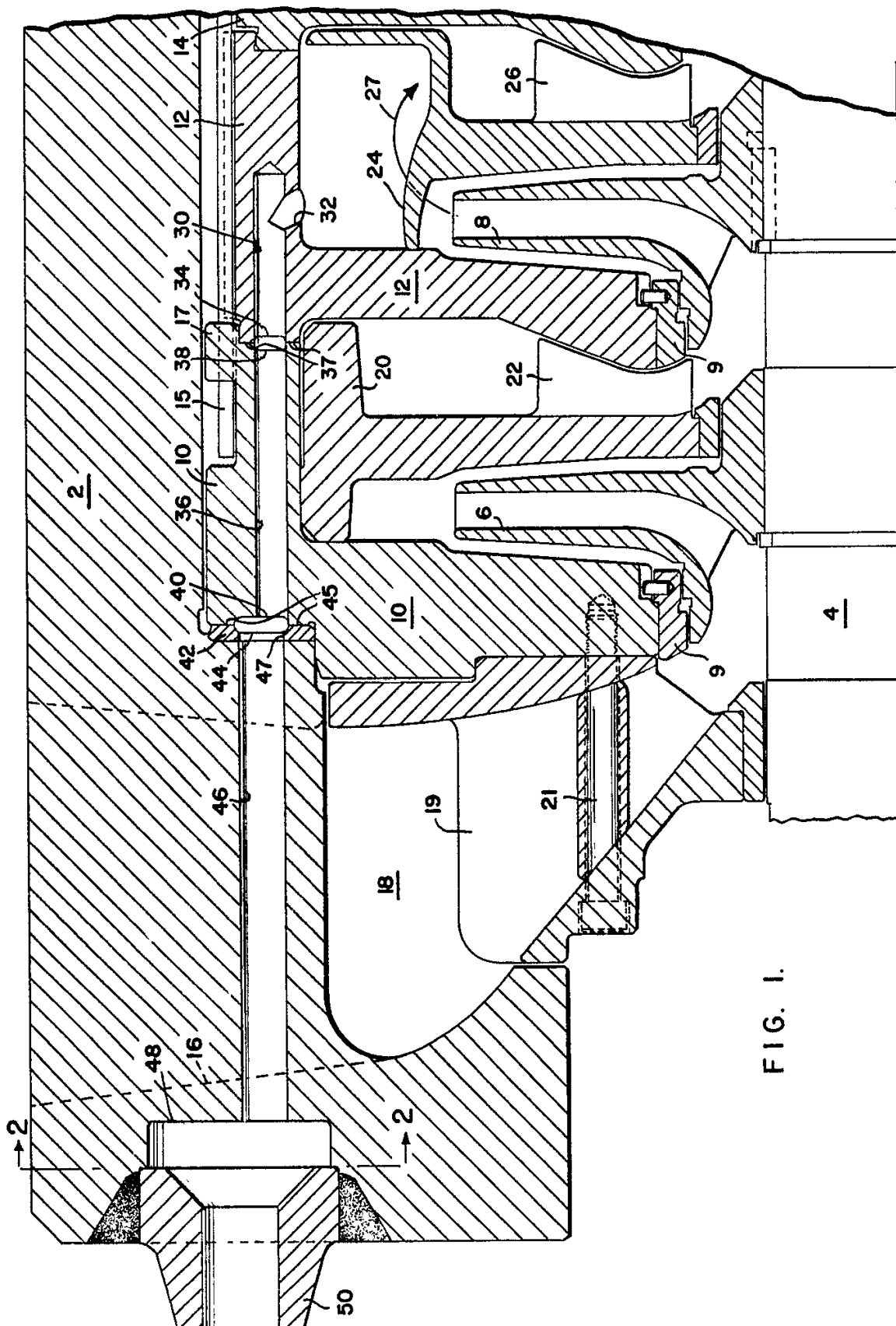
1964-04-29

Abstract

(GB956731)

956,731. Centrifugal pumps and compressors. DE LAVAL STEAM TURBINE CO. April 17, 1962 [Aug. 11, 1961], No. 14918/62. Heading F1C. In a multistage centrifugal pump, compressor, or the like comprising a housing containing a casing formed by a number of annular sections assembled in stacked relationship, successive stage impeller means rotating within the casing and means for bleeding fluid from an intermediate stage of the pump, compressor, or the like, the bleed means comprises at least one axially directed passage in the casing formed by intercommunicating passages in adjoining sections thereof, one of the annular sections having a radially directed passage therein connecting the first-mentioned passage with the interior of the casing, and a passage in the housing communicating with the first-mentioned passage and leading to the outside of the housing. In the centrifugal pump shown, an outer steel casing 2 contains an inner casing formed by joining concentric annular interstage portions, such as 12 and 14, and an end portion 10 by tie rods 15 (see Specification 956,732) which are anchored at their ends by shoulders engaging a flange 17 and are installed in a heated condition. The liquid is supplied through inlet 16, volute 18 and guide vanes 19 to the first stage impeller 6, from where it flows through diffuser 20 to the remaining stages. Some of the liquid leaves the second stage through a group of six by-pass ports 32, arranged approximately opposite the cross-over passage of the second-stage diffuser 24, and thence passes through six passages 30 in portion 12, six aligned passages 36 in portion 10 and three passages 46 in the outer casing 2. Circumferential channels 34, 38, 40, 44 interconnect the passages. The passages 46 discharge into a chamber 48 which is connected through welded connection 50 to auxiliary equipment or the like. The channel 44 and holes 47, aligned with the passages 46, are provided in an annular stainless steel insert 42 welded to the casing 2. Portion 10 is pulled against the insert 42 by bolts (not shown) anchored in the casing 2. Two connections 50 spaced approximately 180 degrees apart, each associated with a separate cross-over passage in the same diffuser, may be provided to feed separate units, or they may be connected 'externally to combine their output. A number of separate connections may be provided which are circumferentially spaced and each associated with a different stage of the pump, thereby providing a selection of pressures. The interstage portions 12, 14 are machined from duplicated stock parts, and the diffusers 20, 24 may be similarly constructed.

Images



Family 11/11 - FAMPAT - ©Questel

Title

(FR1234602)

Centrifugal pump composed of juxtaposed elements

Publication numbers

FR1234602

Publication dates

1960-10-18