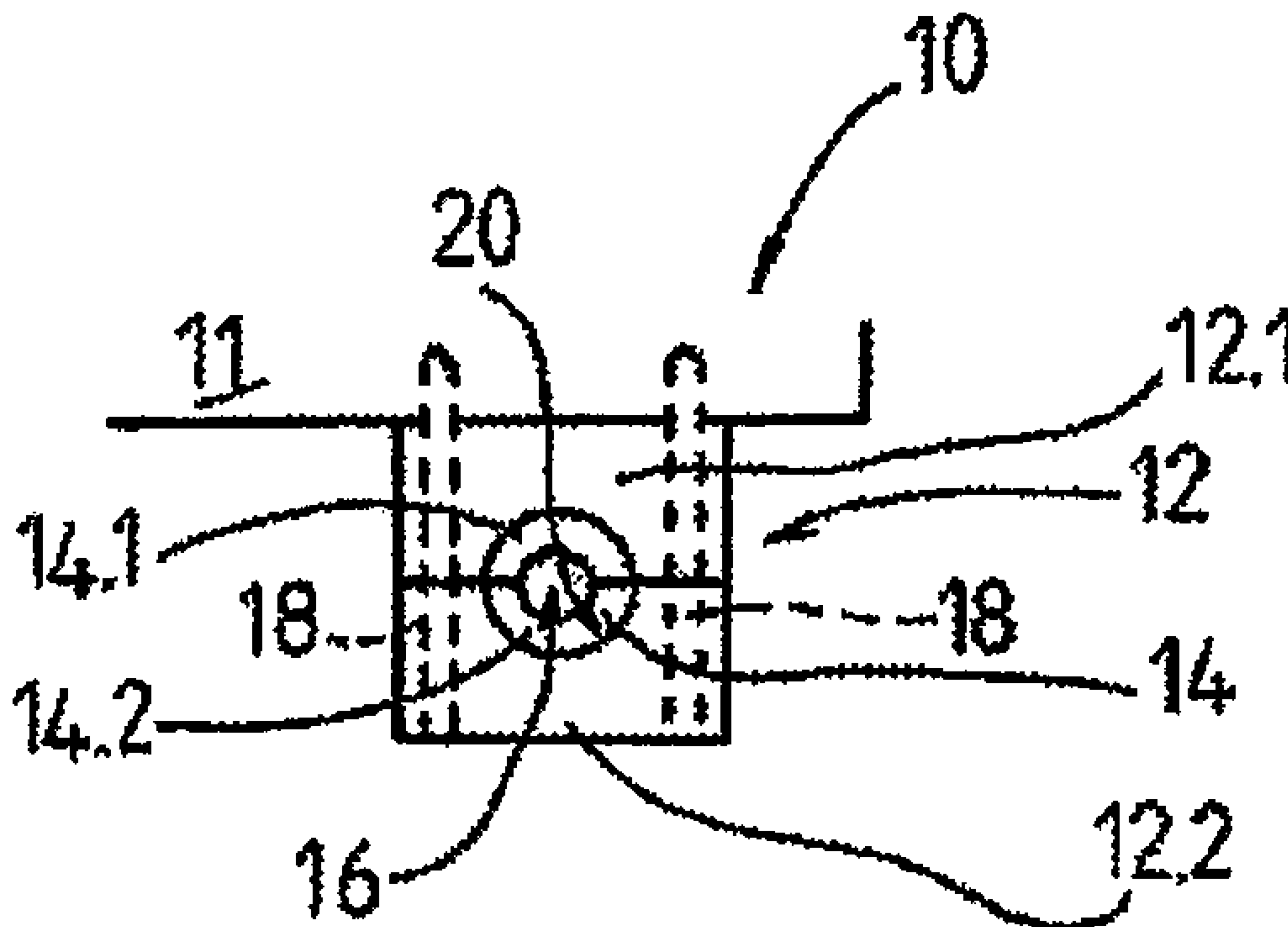




(86) Date de dépôt PCT/PCT Filing Date: 2004/11/04
(87) Date publication PCT/PCT Publication Date: 2006/05/11
(85) Entrée phase nationale/National Entry: 2006/11/06
(86) N° demande PCT/PCT Application No.: ZA 2004/000136
(87) N° publication PCT/PCT Publication No.: 2006/050541

(51) Cl.Int./Int.Cl. *F16C 29/02* (2006.01),
F16C 33/04 (2006.01)
(71) Demandeurs/Applicants:
VON MALTITZ, RONALD MURRAY, ZA;
GROBBELAAR, HENDRIK FREDERIK FERDINANDUS,
ZA
(72) Inventeur/Inventor:
GROBBELAAR, HENDRIK FREDERIK FERDINANDUS,
ZA
(74) Agent: FURMAN & KALLIO

(54) Titre : ENSEMBLE PALIER
(54) Title: A BEARING ASSEMBLY



(57) **Abrégé/Abstract:**

The invention provides a bearing assembly 10 which includes a bearing mount, generally indicated by reference numeral 12, and a bearing 14. The bearing 14 is on the bearing mount 12 and is of a ceramic material. The mount 12 can typically be of metal. The bearing 14 can be of a moulded ceramic material. The bearing 14 can be cast to any desired shape or size depending on the application. The bearing 14 can be defined by a plurality of ceramic tiles or strips secured on the bearing mount 12. The bearing 14 can be secured on the bearing mount 12 by bonding. Instead, or in addition, the bearing 14 can be secured on the bearing mount 12 by any appropriate mechanical arrangement.



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



PCT



(10) International Publication Number
WO 2006/050541 A1

(43) International Publication Date
11 May 2006 (11.05.2006)

(51) International Patent Classification⁷: F16C 29/02,
33/04

(21) International Application Number:
PCT/ZA2004/000136

(22) International Filing Date:
4 November 2004 (04.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): VON MALTITZ, Ronald Murray [ZA/ZA]; 3 Dobson Close, Froggy Farm, 7975 Simon's Town (ZA).

(71) Applicant and
(72) Inventor: GROBBELAAR, Hendrik Frederik Fer-
dinandus [ZA/ZA]; 14 Bosvlier Street, 1390 PHAL-
ABORWA (ZA).

(74) Agent: WWW.PATENTATTORNEY.ZA.COM
LUTEREK, JANUSZ, F; P.O.BOX 8349, 0001 PRETORIA (ZA).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

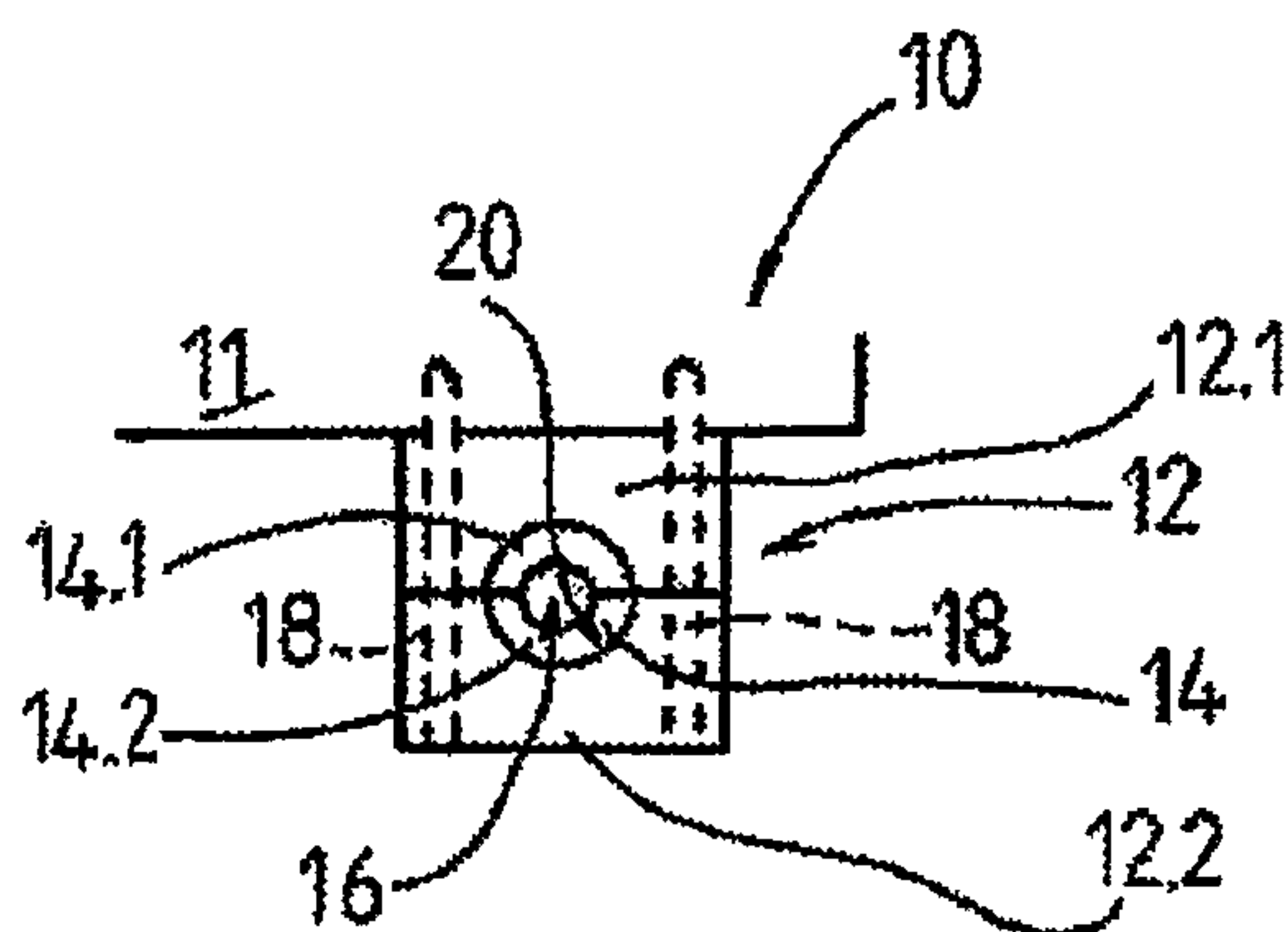
(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- *with international search report*
- *with amended claims*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A BEARING ASSEMBLY



(57) Abstract: The invention provides a bearing assembly 10 which includes a bearing mount, generally indicated by reference numeral 12, and a bearing 14. The bearing 14 is on the bearing mount 12 and is of a ceramic material. The mount 12 can typically be of metal. The bearing 14 can be of a moulded ceramic material. The bearing 14 can be cast to any desired shape or size depending on the application. The bearing 14 can be defined by a plurality of ceramic tiles or strips secured on the bearing mount 12. The bearing 14 can be secured on the bearing mount 12 by bonding. Instead, or in addition, the bearing 14 can be secured on the bearing mount 12 by any appropriate mechanical arrangement.

WO 2006/050541 A1

A BEARING ASSEMBLY

FIELD OF THE INVENTION

This invention relates to a bearing. In particular, the invention relates to a bearing assembly and to a bearing.

BACKGROUND

In the field of mechanical apparatus, and the like, use is often made of bearings to inhibit wear between parts, or components, or the like, which move relative to each other while in contact with each other. In some cases, components are arranged to be in sliding contact with each other. For example, in the case of mechanical hoisting apparatus, rope conveyance apparatus, elevators, or lifts, and the like, elongate elements, such as steel wire wound ropes, or cables, and the like, are often guided through the apparatus and make sliding contact with the apparatus when in use.

In the case of conveyances arranged to travel along a constrained path defined by an elongate element, such as a wire wound rope, or cable, or the like, the conveyance is often guided along the elongate element by means of a constraining mechanism on the conveyance. The constraining mechanism is typically arranged to run along the elongate element so as to guide the conveyance along the elongate element. Frictional contact typically takes place between the elongate element and the constraining mechanism as the conveyance is guided along the elongate element. In some cases constraining mechanisms make use of guide rollers arranged to roll along the elongate element. In other cases constraining mechanisms make use of longitudinal low friction material slippers, or slide bearings.

It has been found that constraining mechanisms making use of guide rollers provide relatively low frictional resistance but are relatively maintenance intensive. Furthermore, constraining mechanisms making use of guide rollers typically have rather

bulky and relatively complicated support structures which are sometimes impractical. In the case of longitudinal low friction material slippers, or slide bearings, it has been found that constraining mechanisms which make use thereof suffer from relatively high rates of wear and cause the elongate element to suffer from wear as well.

Traditionally, the materials of which the longitudinal low friction material slippers have been made have been relatively soft to inhibit wear on the elongate element. Such materials include non-magnetic metals, such as brass, bronze, and the like, as well as plastics, nylons, urethanes and the like. Although such materials inhibit wear on the elongate element, these materials have been found to exhibit relatively high wear rates resulting in relatively high levels of consumption, frequent operational downtime and relatively high production cost losses, in certain cases. Attempts have been made to provide lubrication between the elongate element and such constraining mechanisms, but these attempts have met with limited success. The use of relatively soft magnetic metals has been investigated. However, such metals typically have higher coefficients of friction than the non magnetic metals mentioned above which typically causes higher wear rates of the elongate element which is undesirable.

It is an object of this invention to provide a constraining mechanism which is simpler than those which make use of guide rollers and which has a lower rate of wear than the constraining mechanisms of the longitudinal low friction material slipper type.

SUMMARY OF THE INVENTION

According to the invention, there is provided a bearing assembly including a bearing mount and a bearing on the bearing mount, the bearing being of a ceramic material.

The bearing may be defined by a plurality of ceramic tiles secured on the bearing mount.

The bearing may be of a moulded ceramic material.

The bearing may be secured on the bearing mount by bonding. Instead, or in addition, the bearing may be secured on the bearing mount by mechanical means.

The bearing may be secured on the bearing mount by mechanical means in the form of screw-threaded fasteners.

The bearing may be defined by at least two parts.

The bearing mount may be defined by at least two parts releasably secured together to enable the parts to be separated from one another.

The bearing may be defined between the two parts of the bearing mount and may define a passage extending through the bearing assembly when the two parts of the bearing mount are releasably secured together.

The bearing may be releasably mounted on the bearing mount.

The bearing mount may include at least two parts releasably secured together to enable the parts to be separated so as to enable the bearing to be removed from the bearing mount.

The bearing mount may define a bearing seat when the two parts are releasably secured together, on which bearing seat the bearing is releasably mounted.

Each part of the bearing mount may define a cross-sectionally generally semi-circular shaped surface such that when the parts of the bearing mount are releasably secured together, the bearing mount defines a cross-sectionally generally circular shaped bearing seat.

The parts of the bearing mount may be releasably secured together by means of conventional screw-threaded fasteners.

The bearing may define an outer cross-sectionally generally circular shaped surface arranged to seat between the bearing surfaces of the parts of the bearing mount when the parts of the bearing mount are secured together.

The bearing may define an internal bearing passage extending therethrough, the passage being arranged to receive an elongate component in sliding relationship therethrough.

The bearing passage may be cross-sectionally generally circular in shape.

The bearing may be elongate and may define a collar formation projecting radially outwardly from at least one end. The bearing may define a collar formation projecting radially outwardly from each end.

The bearing may be defined by at least two parts. Each part of the bearing may be elongate and may define a cross-sectionally generally semi-circular axially extending outer and inner surface.

According to another aspect of the invention, there is provided a bearing including a body formed from a ceramic material.

The body may be elongate.

The body may define an axially extending cross-sectionally part circular outer surface. The body may define an axially extending cross-sectionally generally semi-circular outer surface.

The body may define an axially extending cross-sectionally part circular inner

surface. The body may define an axially extending cross-sectionally generally semi-circular inner surface.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described, by way of example, with reference to the accompanying diagrammatic drawings, in which:

Figure 1 shows a schematic end view of a bearing assembly in accordance with the invention;

Figure 2 shows a schematic plan view of the bearing assembly shown in Figure 1;

Figure 3 shows a schematic side view of the bearing assembly shown in Figures 1 and 2;

Figure 4 shows a schematic three-dimensional exploded view of another bearing assembly in accordance with the invention; and

Figure 5 shows a schematic three-dimensional exploded view of yet another bearing assembly in accordance with the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to Figures 1 to 3 of the drawings, a bearing assembly, in accordance with the invention, is generally indicated by reference numeral 10. The bearing assembly 10 can typically be used as a constraining mechanism in a high speed winding operation, or the like, or another kind of conveyance, for example. When used for such a purpose, the assembly 10 is typically mounted on a conveyance apparatus, or structure, schematically indicated at 11. It is envisaged that the assembly 10 can advantageously be used in hoisting, rope conveying and elevator applications. However, it is to be

appreciated that the bearing assembly of the invention is not limited for use as a constraining mechanism in such applications only, but extends to use as a slide bearing in general.

The bearing assembly 10 includes a bearing mount, generally indicated by reference numeral 12, and a bearing 14. The bearing 14 is on the bearing mount 12 and is of a ceramic material. The mount 12 can typically be of metal.

The bearing 14 can be of a moulded ceramic material. The bearing 14 can be cast to any desired shape or size depending on the application. The bearing 14 can be defined by a plurality of ceramic tiles or strips secured on the bearing mount 12. The bearing 14 can be secured on the bearing mount 12 by bonding. Instead, or in addition, the bearing 14 can be secured on the bearing mount 12 by any appropriate mechanical arrangement.

Instead, the bearing 14 can be defined by at least two parts 14.1, 14.2. The parts 14.1, 14.2 of the bearing 14 can be secured on the bearing mount 12 by mechanical means, such as by means of screw-threaded fasteners, or the like, for example. Instead, or in addition, the parts can be secured on the bearing mount 12 by bonding.

The bearing mount 12 is typically defined by two parts 12.1, 12.2. The parts 12.1, 12.2 are secured to one another releasably to enable the parts 12.1, 12.2 to be separated from one another. The bearing 14 is defined between the two parts 12.1, 12.2 of the bearing mount 12 and defines a bearing passage 16 extending through the bearing assembly 10 when the two parts 12.1, 12.2 of the bearing mount 12 are releasably secured together. The passage 16 is arranged to receive an elongate component, such as an elongate element 17 in the form of a wire wound rope, or the like, for example, in sliding relationship therethrough. The bearing passage 16 is typically cross-sectionally generally circular in shape. It will be appreciated that when the element 17 is received in sliding relationship in the passage 16, the axial movement along the element 17 can be achieved but lateral movement relative to the element 17 is inhibited.

In one embodiment, the bearing 14 is releasably mounted on the bearing mount 12. Accordingly, in such a case, the bearing 14 can be removed and replaced by separating the parts 12.1, 12.2 of the bearing mount 12 from one another. The parts 12.1, 12.2 can be secured relative to one another by means of conventional screw-threaded fasteners, such as bolts, screws, or the like, extending through apertures 18.

The bearing mount 12 defines a bearing seat 20 when the two parts 12.1, 12.2 are releasably secured together. The bearing 14 is seated on the bearing seat 20 releasably. Each part 12.1, 12.2 of the bearing mount 12 defines a cross-sectionally generally semi-circular shaped surface 20.1, 20.2 such that when the parts 12.1, 12.2 of the bearing mount 12 are releasably secured together, the bearing mount 12 defines a cross-sectionally generally circular shaped bearing seat 20. The bearing 14 defines an outer cross-sectionally generally circular shaped surface arranged to seat between the bearing surfaces 20.1, 20.2 of the parts 12.1, 12.2 of the bearing mount 12 when the parts of the bearing mount 12 are secured together.

Referring now to Figure 4 of the drawings, in which like reference numerals have been used to designate similar parts, unless otherwise stated, another bearing assembly in accordance with the invention is generally indicated by reference numeral 110. The bearing assembly 110 is similar to the assembly 10 save that the one part 112.2 of the bearing mount 112 of the assembly 110 has flange formations 113.1, 113.2.

As can best be seen in Figure 4, the bearing 14 has a body formed from a ceramic material. The body can typically be made up of two parts 14.1, 14.2 as already mentioned. When mounted on the mount 112 the parts 14.1, 14.2 together form the bearing 14. Each bearing part 14.1, 14.2 defines an elongate body having an axially extending cross-sectionally part circular, preferably generally semi-circular, outer surface 14.3. Each bearing part 14.1, 14.2 further defines an axially extending cross-sectionally part circular, preferably generally semi-circular, inner surface 14.4. When in a mounted condition on the mount 112, the inner surfaces 14.4 together define the passage 16 through which the elongate component 17 can extend.

Referring now to Figure 5 of the drawings, in which like reference numerals have been used to designate similar parts, unless otherwise stated, another bearing assembly in accordance with the invention, is generally indicated by reference numeral 210. The bearing assembly 210 is similar to the bearing assembly 110, save that the bearing 114 of the assembly 210 has two parts 114.1, 114.2 each part being elongate and defining a collar formation 114.3, 114.4 projecting radially outwardly from each end 114.5, 114.6. The collar formations 114.3, 114.4 serve to hold the bearing parts, or inserts, 114.1, 114.2 captive on the bearing mount 112 when in a mounted condition.

It will be appreciated that by providing the mount 12, 112 and the bearing 14, 114 in split form, the assemblies 10, 110, 210 can be disassembled and assembled around an elongate component, such as the component 17, without having to thread the component through an aperture such as the passage 16. In certain cases, such as where the elongate element, or guidance system, is fixed as in the case of a rail like elongate element as opposed to flexible as in the case of a rope-like elongate element, the bearing assembly of the invention need not necessarily surround the whole circumference of the elongate element, but can be arranged to extend around the elongate element by a sufficient amount to inhibit the elongate element from escaping laterally. Accordingly, the bearing assembly can be arranged to extend around the elongate element for about 270°, or the like.

WHAT IS CLAIMED IS:

1. A bearing assembly including:
a bearing mount; and
a bearing on the bearing mount, the bearing being of a ceramic material.
2. The bearing assembly as claimed in claim 1, in which the bearing is defined by a plurality of ceramic tiles secured on the bearing mount.
3. The bearing assembly as claimed in claim 1, in which the bearing is of a moulded ceramic material.
4. The bearing assembly as claimed in claim 3, in which the bearing is secured on the bearing mount by bonding.
5. The bearing assembly as claimed in claim 3, in which the bearing is secured on the bearing mount by mechanical means.
6. The bearing assembly as claimed in claim 5, in which the bearing is secured on the bearing mount by mechanical means in the form of screw-threaded fasteners.
7. The bearing assembly as claimed in any one of claims 3 to 6 inclusive, in which the bearing is defined by at least two parts.
8. The bearing assembly as claimed in any one of the previous claims, in which the bearing mount is defined by at least two parts releasably secured together to enable the parts to be separated from one another.
9. The bearing assembly as claimed in claim 8, in which the bearing is defined between the two parts of the bearing mount and defines a passage extending

through the bearing assembly when the two parts of the bearing mount are releasably secured together.

10. The bearing assembly as claimed in claim 1, in which the bearing is releasably mounted on the bearing mount.
11. The bearing assembly as claimed in claim 10, in which the bearing mount includes at least two parts releasably secured together to enable the parts to be separated so as to enable the bearing to be removed from the bearing mount.
12. The bearing assembly as claimed in claim 11, in which the bearing mount defines a bearing seat when the two parts are releasably secured together, on which bearing seat the bearing is releasably mounted.
13. The bearing assembly as claimed in claim 12, in which each part of the bearing mount defines a cross-sectionally generally semi-circular shaped surface such that when the parts of the bearing mount are releasably secured together, the bearing mount defines a cross-sectionally generally circular shaped bearing seat.
14. The bearing assembly as claimed in claim 13, in which the parts of the bearing mount are releasably secured together by means of conventional screw-threaded fasteners.
15. The bearing assembly as claimed in claim 13 or claim 14, in which the bearing defines an outer cross-sectionally generally circular shaped surface arranged to seat between the bearing surfaces of the parts of the bearing mount when the parts of the bearing mount are secured together.
16. The bearing assembly as claimed in claim 15, in which the bearing defines an internal bearing passage extending therethrough, the passage being arranged to receive an elongate component in sliding relationship therethrough.

17. The bearing assembly as claimed in claim 16, in which the bearing passage is cross-sectionally generally circular in shape.
18. The bearing assembly as claimed in claim 17, in which the bearing is elongate and defines a collar formation projecting radially outwardly from at least one end.
19. The bearing assembly as claimed in claim 18, in which the bearing defines a collar formation projecting radially outwardly from each end.
20. The bearing assembly as claimed in any one of claims 15 to 19 inclusive, in which the bearing is defined by at least two parts.
21. The bearing assembly as claimed in claim 20, in which each part of the bearing is elongate and defines a cross-sectionally generally semi-circular axially extending outer and inner surface.
22. A bearing including:
a body formed from a ceramic material.
23. The bearing as claimed in claim 22, in which the body is elongate.
24. The bearing as claimed in claim 23, in which the body defines an axially extending cross-sectionally part circular outer surface.
25. The bearing as claimed in claim 24, in which the body defines an axially extending cross-sectionally generally semi-circular outer surface.
26. The bearing as claimed in any one of claims 23 to claim 25 inclusive, in which the body defines an axially extending cross-sectionally part circular inner surface.

27. The bearing as claimed in claim 26, in which the body defines an axially extending cross-sectionally generally semi-circular inner surface.
28. A bearing assembly substantially as herein described and illustrated.
29. A bearing substantially as herein described and illustrated.

AMENDED CLAIMS

[received by the International Bureau on 21 February 2006 (21.02.06);
original claims 1-29 amended (3 pages)]

1. A bearing assembly including:
a bearing mount; and
a bearing on the bearing mount, the bearing being of a ceramic material;
wherein the bearing mount includes at least two parts releasably secured together, each part of the bearing mount defining a cross-sectionally generally semi-circular shaped surface such that when the parts of the bearing mount are secured together, the bearing mount defines a cross-sectionally generally circular shaped bearing seat so that the bearing defines an internal bearing passage extending therethrough, the passage being arranged to receive an elongate component in sliding relationship therethrough.
2. The bearing assembly as claimed in claim 1, in which the bearing is defined by a plurality of ceramic tiles secured on the bearing mount.
3. The bearing assembly as claimed in claim 1, in which the bearing is of a moulded ceramic material.
4. The bearing assembly as claimed in claim 3, in which the bearing is secured on the bearing mount by bonding.
5. The bearing assembly as claimed in claim 3, in which the bearing is secured on the bearing mount by mechanical means.
6. The bearing assembly as claimed in claim 5, in which the bearing is secured on the bearing mount by mechanical means in the form of screw-threaded fasteners.
7. The bearing assembly as claimed in any one of claims 3 to 6 inclusive, in which the bearing is defined by at least two parts.
8. The bearing assembly as claimed in any one of the previous claims, in which the

bearing mount is defined by at least two parts releasably secured together to enable the parts to be separated from one another.

9. The bearing assembly as claimed in claim 8, in which the bearing is defined between the two parts of the bearing mount and defines a passage extending through the bearing assembly when the two parts of the bearing mount are releasably secured together.
10. The bearing assembly as claimed in 1, in which the bearing is elongate and defines a collar formation projecting radially outwardly from at least one end.
11. The bearing assembly as claimed in claim 10, in which the bearing defines a collar formation projecting radially outwardly from each end.
12. The bearing assembly as claimed in claim 1, in which each part of the bearing is elongate and defines a cross-sectionally generally semi-circular axially extending outer and inner surface.
13. The bearing assembly as claimed in any one of the preceding claims, wherein the elongate member is a rope.
14. The bearing assembly as claimed in any one of the preceding claims, wherein the elongate member is a steel rope and the internal bearing passage and rope are sized and dimensioned so that there is a clearance between the rope and the passage.
15. A bearing including:
a body formed from a ceramic material, which body is elongate and defines an axially extending cross-sectionally part circular inner surface.
16. The bearing as claimed in claim 15, in which the body defines an axially extending cross-sectionally generally semi-circular inner surface.

17. A bearing assembly substantially as herein described and illustrated.
18. A bearing substantially as herein described and illustrated.
19. A new bearing assembly or a new bearing substantially as herein described.

FIG. 1

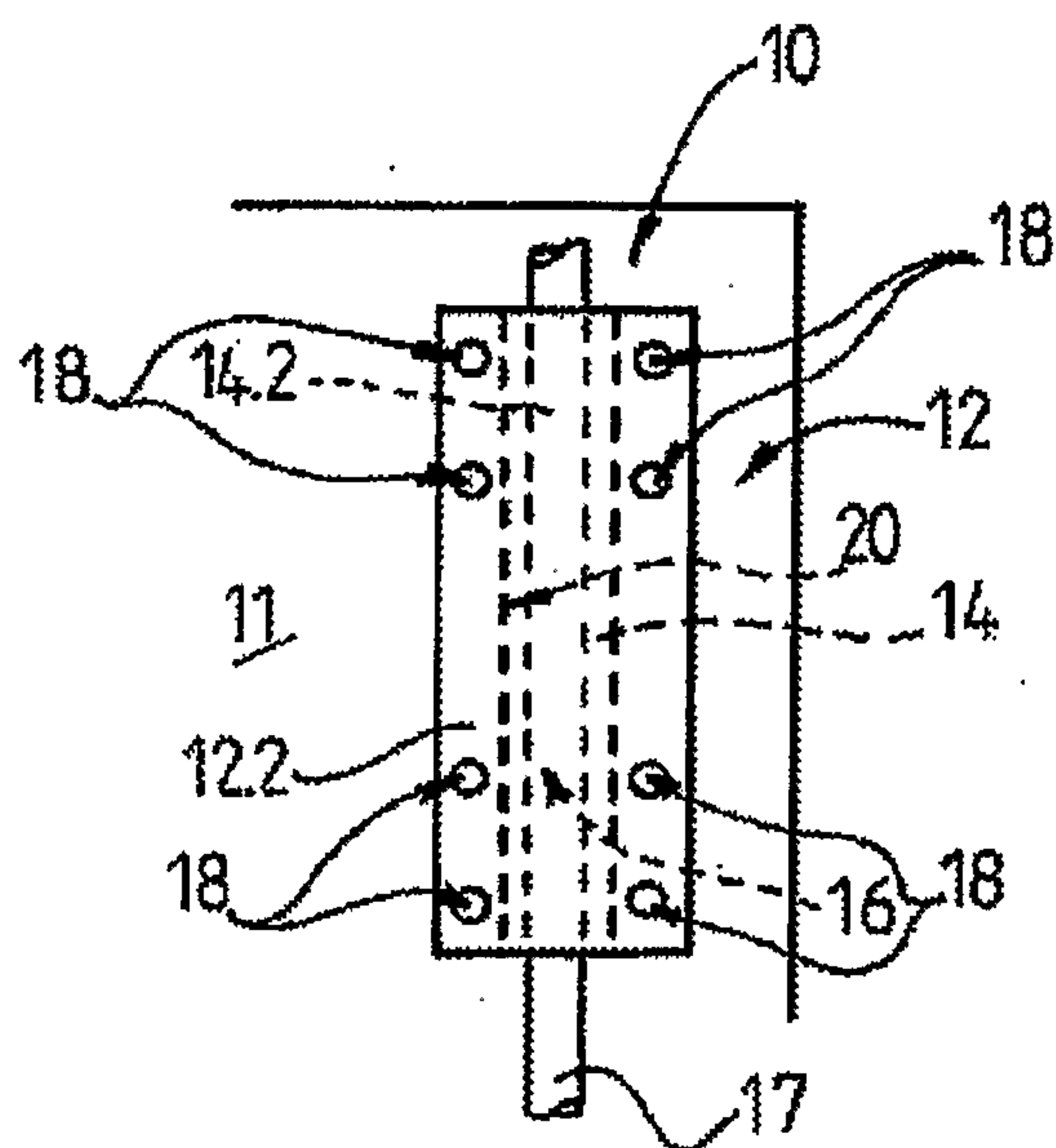
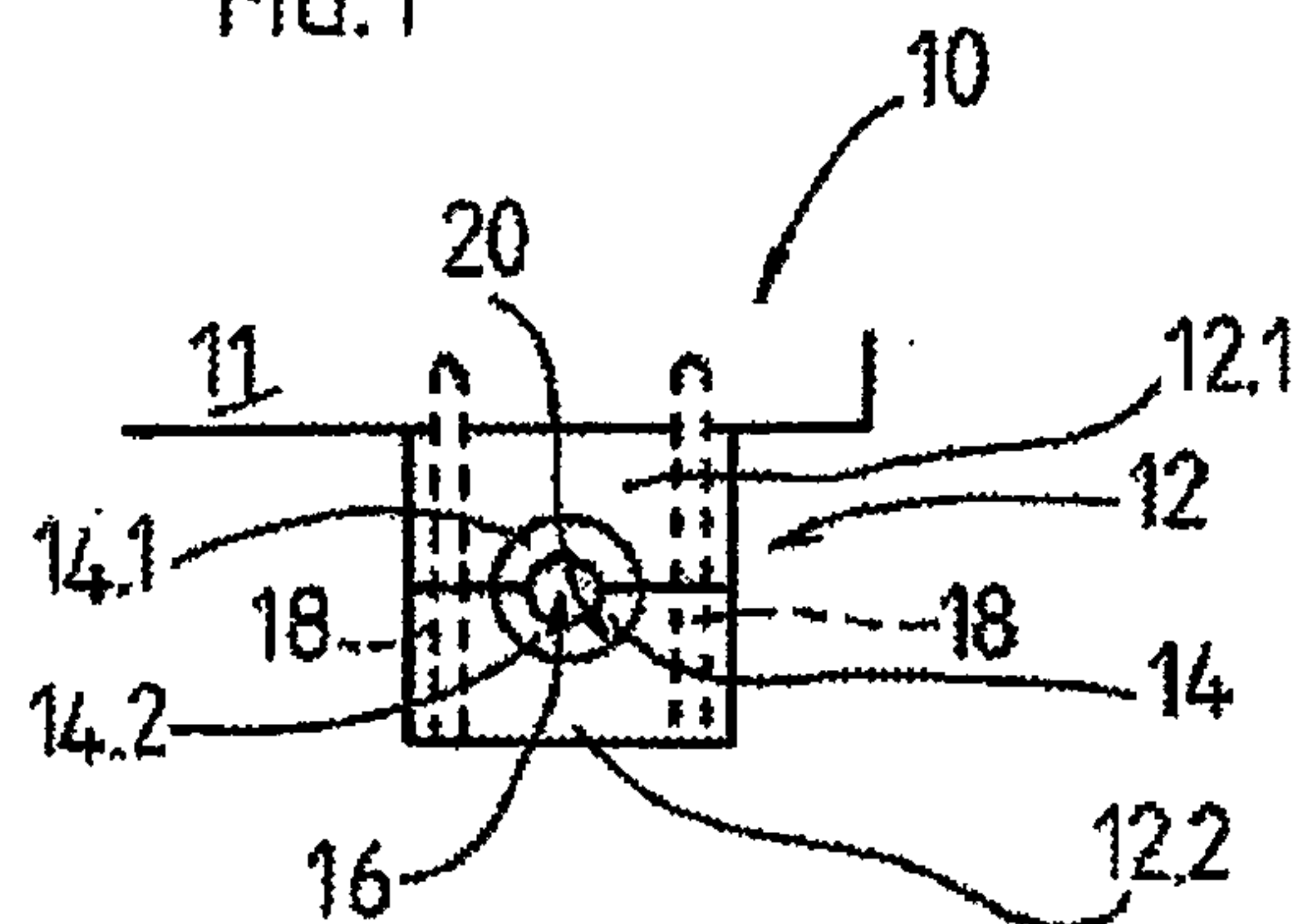


FIG. 2

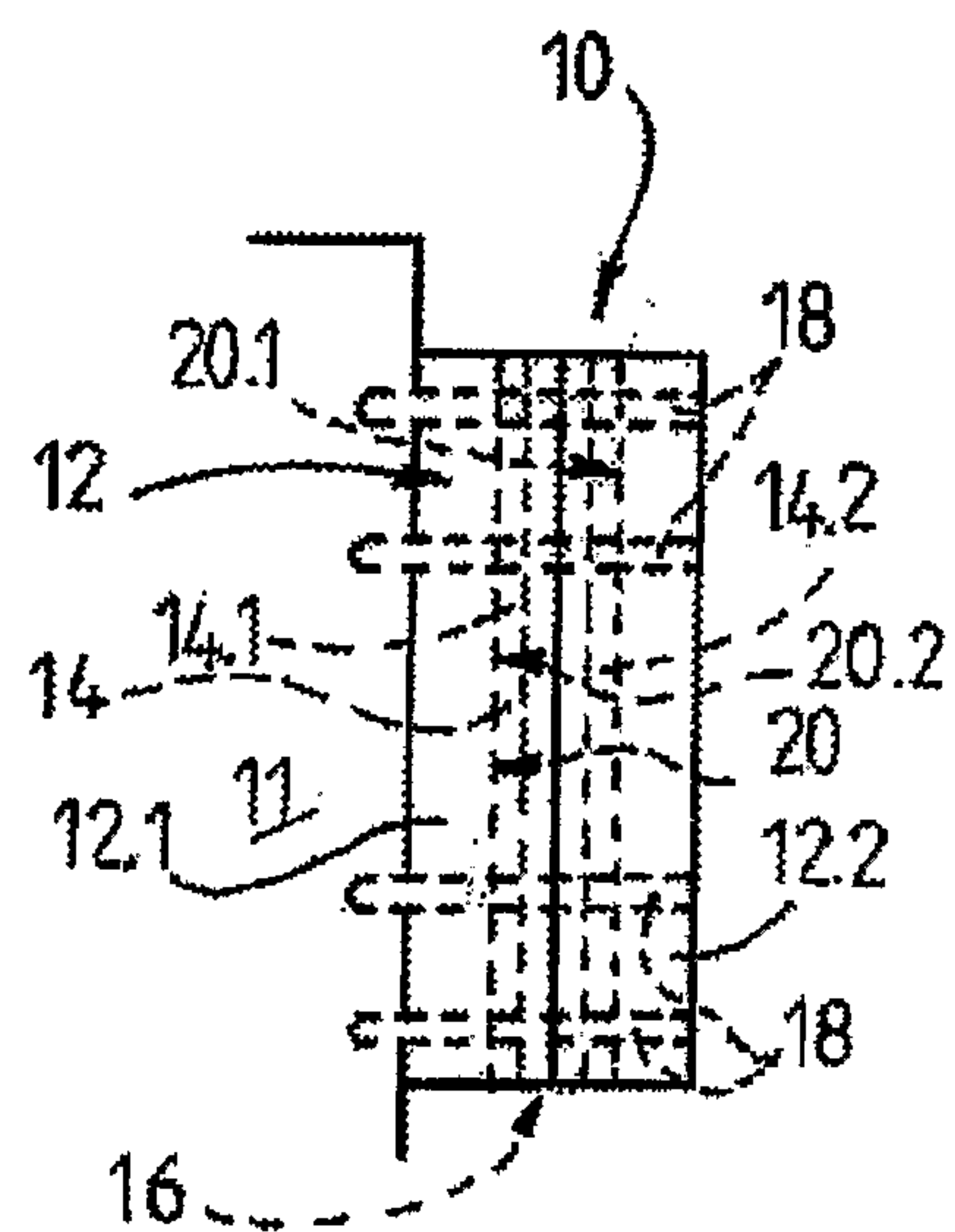


FIG. 3

