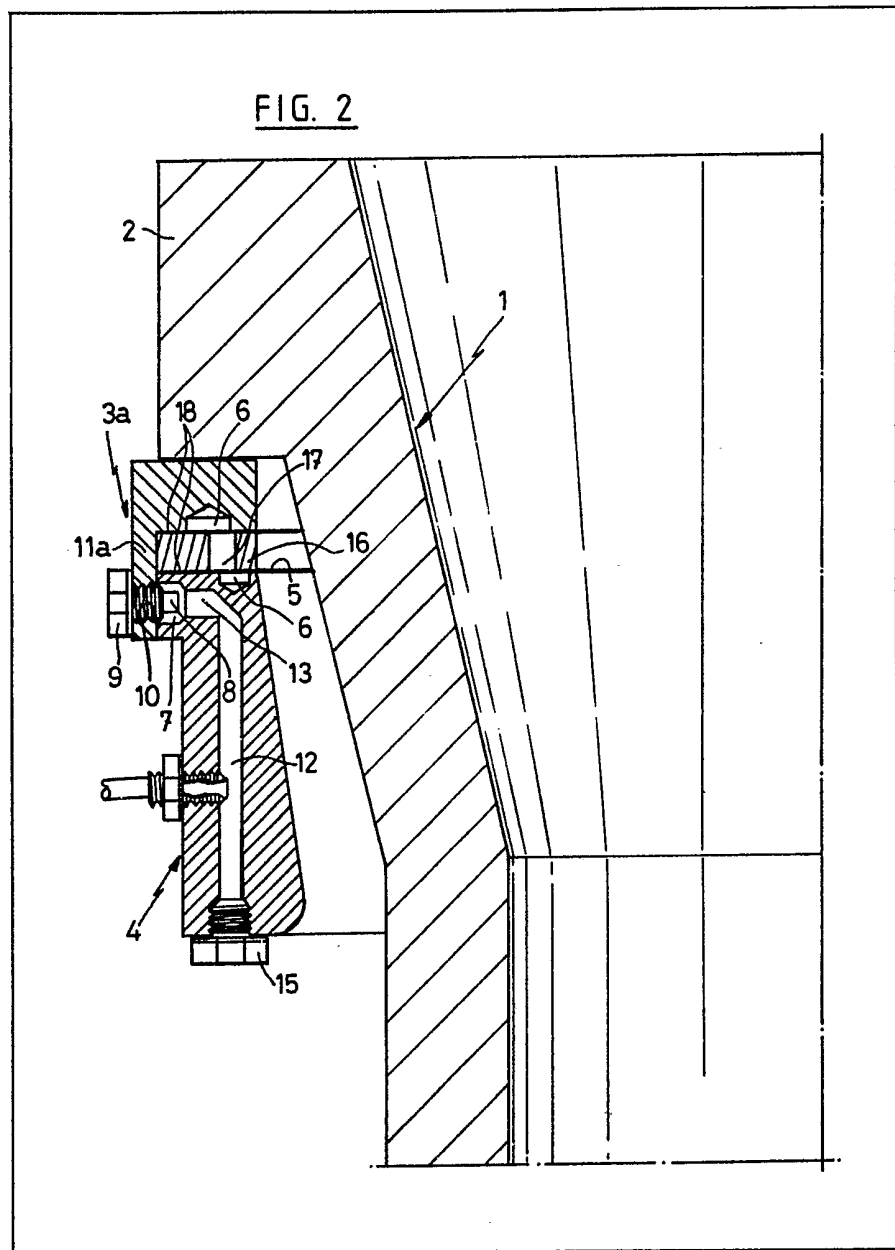


- (21) Application No 8007825
- (22) Date of filing 7 Mar 1980
- (43) Application published 16 Sep 1981
- (51) INT CL³ B22D 11/10 41/08
- (52) Domestic classification F4B 126 GX
- (56) Documents cited GB 1568518 GB 1563966
- (58) Field of search F4B
- (71) Applicants Vesuvius International Corporation, 100 West Tenth Street, Wilmington, United States of America
- (72) Inventors Rudi Müller, Wolfgang Löser
- (74) Agents Frank B. Dehn & Co., Imperial House, 15-19 Kingsway, London WC2B 6UZ

(54) **Ladle shroud support assembly**

(57) A support assembly for a pouring stream protection shroud 1 at the outlet gate of a metal pour vessel (not shown), comprises at least one intermediate bearing ring 3a provided between the protection shroud 1 and a shroud holding ring 4 supporting said shroud at the outlet gate of the metal pour vessel. The holding ring is

provided with cooling gas channels 12, and the bearing ring 3a and holding ring 4 are interlocked by means of bolts 8 extending into a peripheral groove 7 formed in holding ring 4 and sandwiching a further intermediate bearing ring 16 therebetween. Lubricant is supplied to the sliding surface through peripheral bores 6 and connecting bores 17 formed in ring 16.



GB 2 071 289 A

FIG. 1

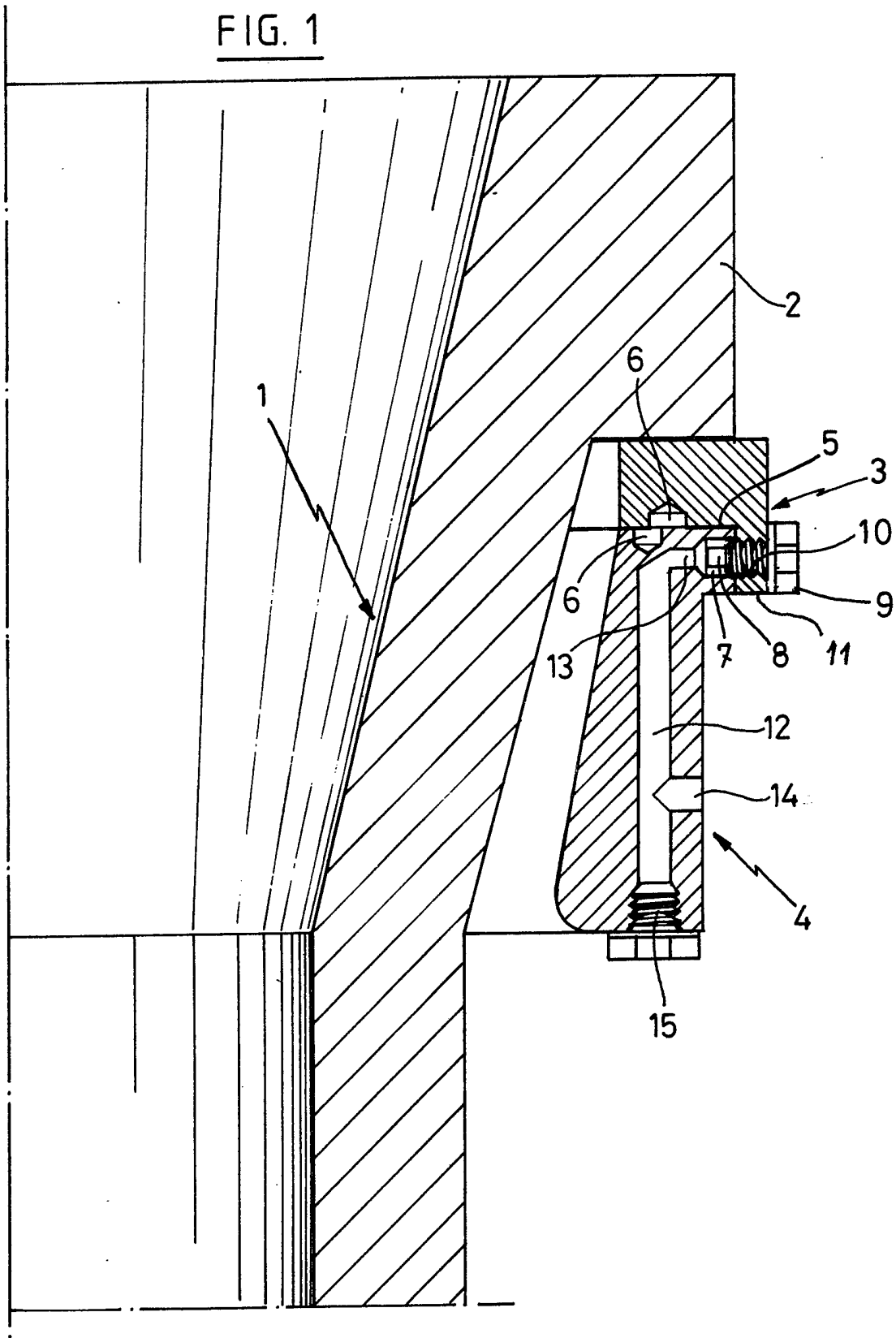


FIG. 2

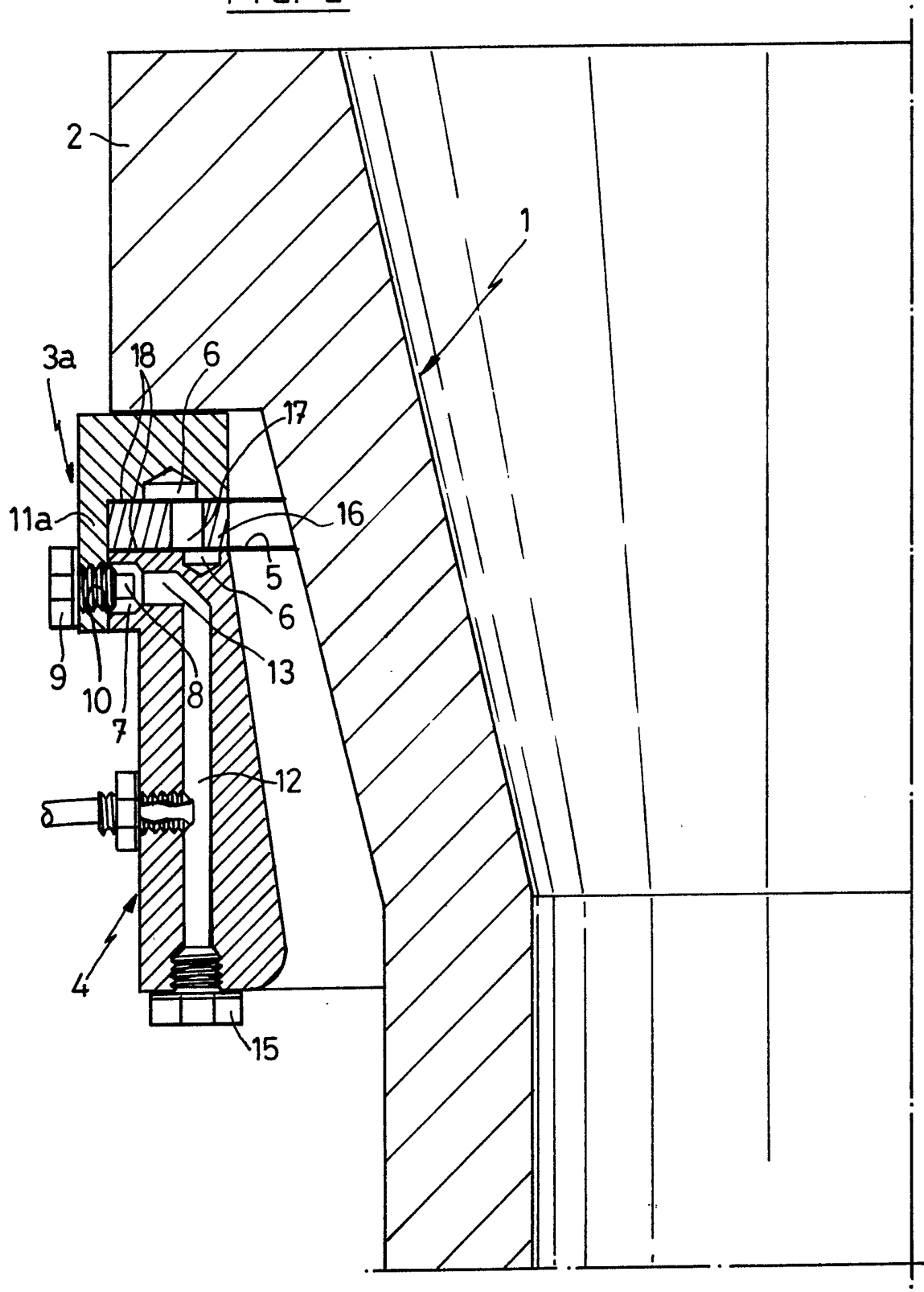


FIG. 3

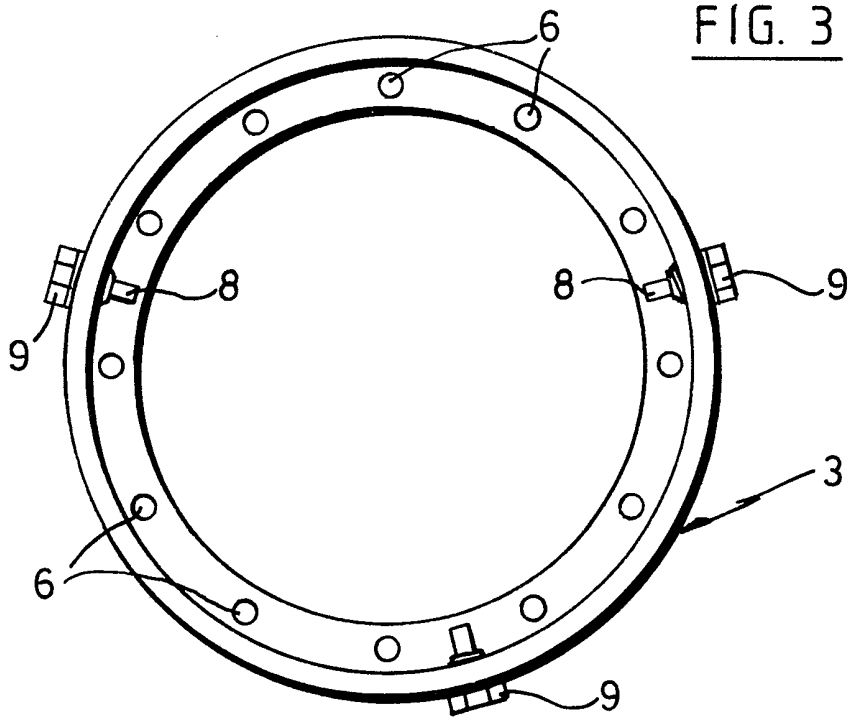
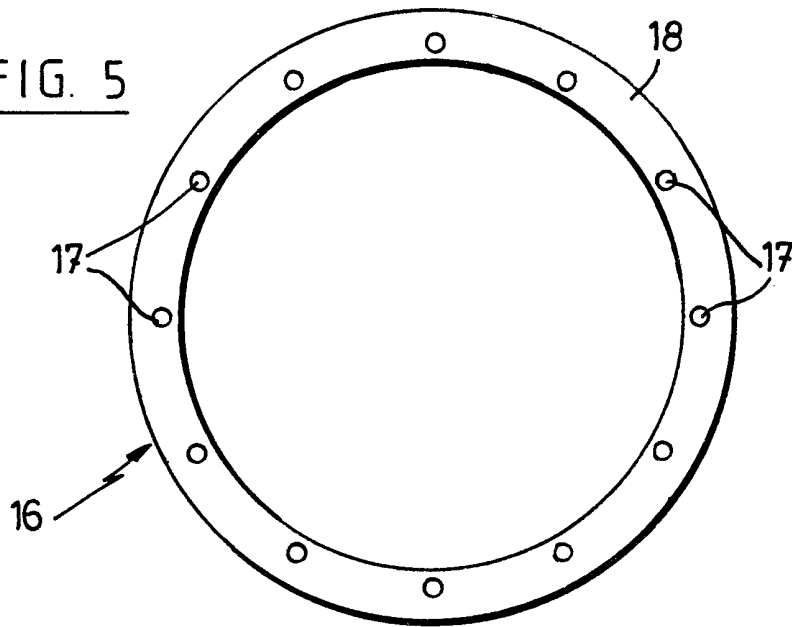


FIG. 5



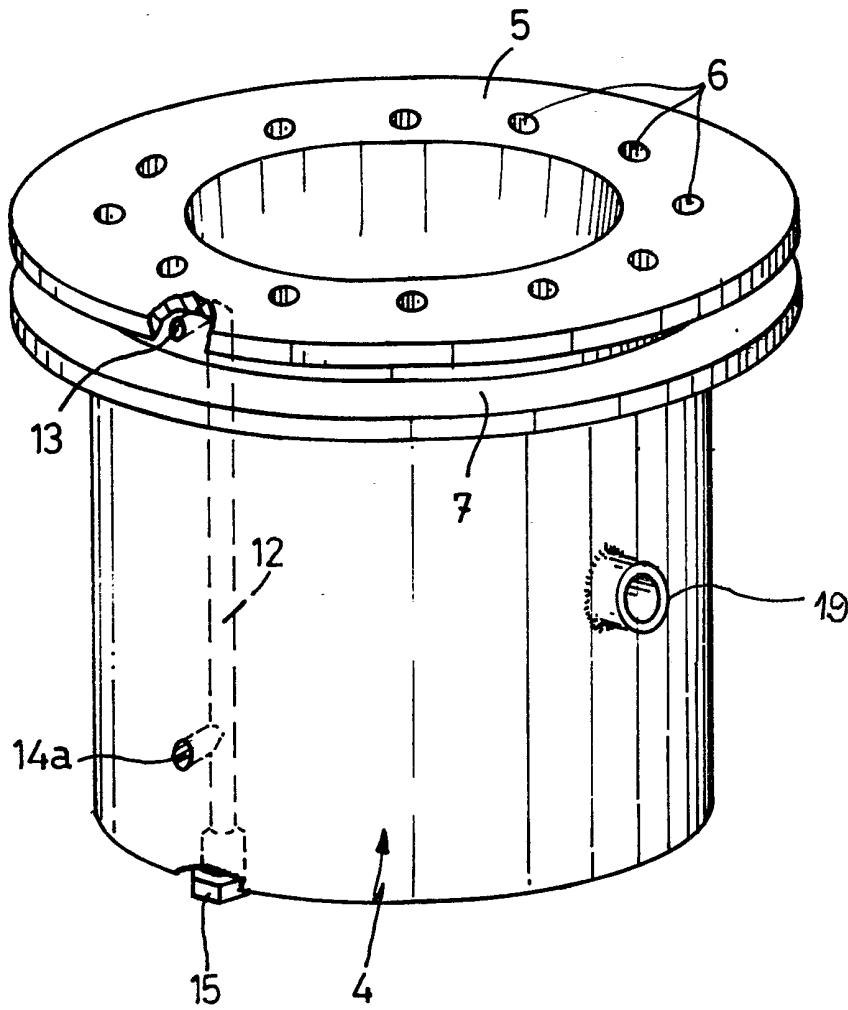


FIG. 4

SPECIFICATION

Ladle shroud support assembly

This invention relates to apparatus for holding a protection shroud at the outlet gate of a metal pour vessel.

During casting of metal from pouring vessels the pouring stream of molten metal may be shielded with a protection tube, called a ladle shroud. Such shrouds are commonly supported in front of the pouring gate by means of a holding device consisting of a supporting ring, supporting fork and supporting lever. When such holding devices are used in connection with a linear or rotary slide gate at the vessel outlet however, movement of the slide gate has resulted in importing a rotary movement to the ladle shroud and consequently to the collector nozzle gate. Apart from being a source of wear for the refractory parts this also involves the risk of disengaging said parts from their supports.

It is the object of this invention to provide a new holding device for ladle shrouds which will avoid the above mentioned drawbacks of the known holding devices.

According to the invention there is provided a support assembly for a pouring stream protection shroud at the outlet gate of a metal pour vessel, in which at least one intermediate bearing ring is provided between the protection shroud and a shroud holding ring supporting said shroud at the outlet gate of the metal pour vessel.

In a preferred embodiment of the invention, said intermediate bearing ring(s) form with said shroud holding ring at least one plain sliding surface for an easy rotation motion of the protection shroud with respect to the holding ring, to avoid any rotation of the protection shroud with respect to the outlet gate.

Said intermediate bearing ring(s) and/or the shroud holding ring may suitably comprise means for supplying lubricant to said plain sliding surface(s), which may in particular consist of peripheral lubrication bores.

According to a further preferred feature of the invention, the shroud holding ring and the intermediate bearing ring(s) may constitute an interlocking unit, wherein the intermediate bearing ring(s) is/are slidably attached to the holding ring by suitable interlocking means.

Said interlocking means may in particular consist of rods, pins of the like, disposed on an outer peripheral flange of the intermediate ring, which rods, pins or the like extend into a peripheral groove formed on the outer surface of the holding ring.

The new provisions according to the invention ensure a free rotating motion of the holding device with respect to the protection shroud, even at high temperatures.

The fundamental features of the invention will now be described in greater detail having reference to the attached drawings, illustrating two preferred embodiments of the ladle shroud holding device in accordance with the invention.

In the drawings:

Figure 1 is a sectional view of a first embodiment of a ladle shroud holding device according to the invention (right hand side shown),

Figure 2 is a sectional view of a second embodiment of a ladle shroud holding device according to the invention (left hand side shown),

Figure 3 is a bottom plan view of the top bearing ring in the devices of Figures 1 and 2,

Figure 4 is a perspective view of the bottom holding ring in the devices of Figures 1 and 2,

Figure 5 is a top plan view of the middle bearing ring in the device of Figure 2.

In these Figures, same reference numerals are used to indicate same parts.

Figure 1 shows, in section, the right hand side of a pouring stream protection tube (ladle shroud) 1, bearing with its supporting flange 2 on a bearing ring 3, provided between said supporting flange 2 and a shroud holding ring 4, so as to form a plain surface 5 between said rings for an easy sliding rotation thereof with respect to each other.

In order to improve the sliding performance, the bearing ring 3 and the holding ring 4 are provided with lubrication bores 6 over the whole extent of their sliding surfaces.

The holding ring 4 comprises a peripheral groove 7, into which engage the extremities 8 of assembling bolts 9, which are fixed into bores 10 through an outer peripheral flange 11 of the bearing ring 3.

The holding ring 4 further also comprises two (one represented in the right hand side of the ring) cooling bores 12, communicating with said peripheral groove 7, through bores 13.

Cooling gas is introduced, respectively evacuated from the holding ring 4 through respective bores 14, 14a, whereas the bottom of the cooling bores are closed by means of bolts 15.

As shown more particularly on Figure 4, the holding ring 4 is provided with spindle supports 19 adapted to engage a supporting fork (not represented) for the holding ring.

Figure 2 shows, in section, the left hand side of a pouring stream protection tube (ladle shroud) 1, supported on a second embodiment of the holding device according to the invention, similar to the embodiment of Figure 1 except that a further, intermediate, bearing ring 16 is provided between the bearing ring 3a and the holding ring 4. The lateral circumferential flange 11a of said bearing ring 3a is therefore increased to the extent of the thickness of the intermediate ring 16, with respect to the flange 11 of the bearing ring 3 of the embodiment of Figure 1.

The intermediate ring 16 itself is provided with lubrication holes 17, extending between both sliding surfaces 18 and distributed over the whole periphery thereof (Figure 5).

The remainder of the holding device according to Figure 2 is identical to that of Figure 1 and in particular the holding ring 4 is exactly as represented in Figures 1 and 4.

The top view of the bearing ring 3a on the other

hand corresponds to the representation of Figure 3, in that it only differs from the bearing ring 3 by the height of its peripheral flange 11a.

5 It must be clear that the invention is not limited to those embodiments and details specifically disclosed hereabove and that numerous modifications may be provided to said details without leaving the general outline of the invention as set forth in the attached set of claims.

10 CLAIMS

1. A support assembly for a pouring stream protection shroud at the outlet gate of a metal pour vessel, in which are least one intermediate bearing ring is provided between the protection
15 shroud and a shroud holding ring supporting said shroud at the outlet gate of the metal pour vessel.

2. An assembly according to claim 1, in which said intermediate bearing ring(s) form with said shroud holding ring at least one plain sliding
20 surface for an easy rotation motion of the protection shroud with respect to the holding ring, to avoid rotation of the protection shroud with

respect to the outlet gate.

3. An assembly according to claim 2, in which
25 said intermediate bearing ring(s) and/or the shroud holding ring comprise means for supplying lubricant to said plain sliding surface(s).

4. An assembly according to claim 3, in which said lubrication means consists of peripheral
30 lubrication bores.

5. An assembly according to any of the preceding claims in which the shroud holding ring and the intermediate bearing ring(s) constitute an interlocking unit, wherein the intermediate bearing
35 ring(s) is/are slidably attached to the holding ring by suitable interlocking means.

6. An assembly according to claim 5, in which said interlocking means comprises rods, pins or the like disposed on an outer peripheral flange of the intermediate ring, which rods, pins or the like
40 extend into a peripheral groove formed on the outer surface of the holding ring.

7. A support assembly for a pouring stream protection shroud, substantially as hereinbefore
45 described with reference to the accompanying drawings.