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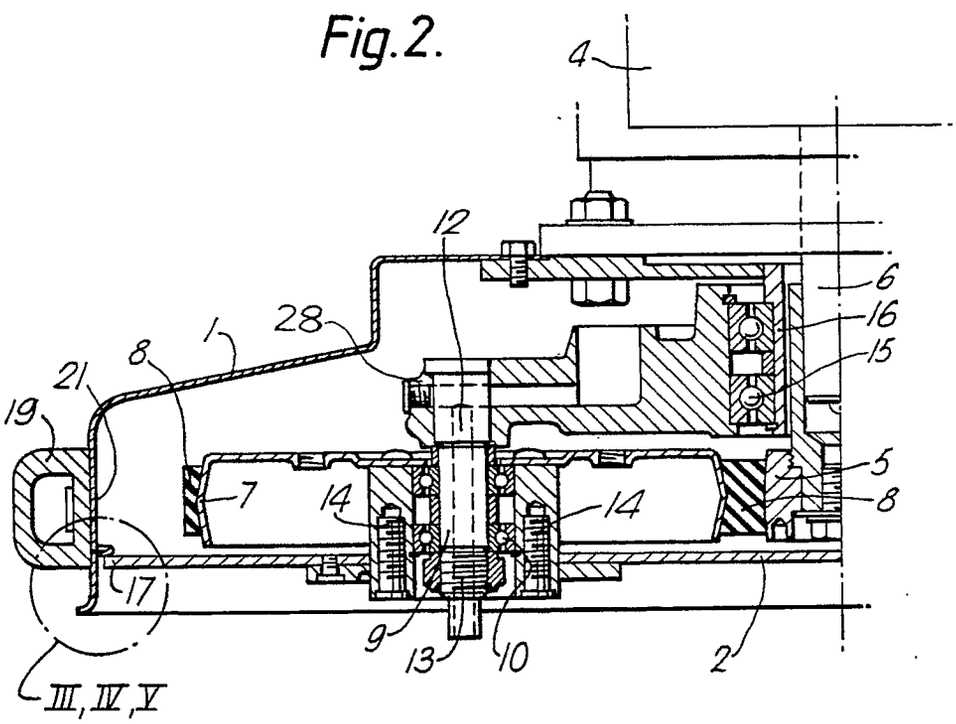
(54) Floor cleaning device.

(57) An internal seal is provided in the housing (1) for a floor cleaner, taking the form of a ridge (17) positioned above the edge of the cleaning head mounting plate (2) or a brush (24) or rubber ring (25) positioned on the plate to contact the inside of the housing (1). This prevents water, dirt etc from entering the housing (1) and adversely affecting the pulley and belt drive system.

Fig.2.



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This invention relates to a floor cleaning device and in particular such a device comprising a plurality e.g. three, cleaning heads, each mounted for rotation about a substantially vertical axis.

In a known form of cleaning device, each cleaning head is mounted for rotation below a substantially horizontal plate and driven through a belt and pulley system mounted above the plate. In order to prevent the ingress of water, dirt and other matter to the drive system a cover bowl is positioned over the system and the plate. The provision of this cover bowl is expensive and adds weight to the device.

It is a general object of the invention to provide a less expensive alternative means to prevent the ingress of water and dirt to the drive mechanism.

In accordance with the invention a floor cleaning device comprises at least one cleaning head mounted for rotation below a substantially horizontal plate, drive means located above the plate for causing rotation of the cleaning head, a housing covering the cleaning head, the plate and the drive means, and sealing means located between the housing and the edge of the plate for preventing the ingress of unwanted matter to the drive means.

The horizontal plate may be in the form of a disc on which a plurality e.g. three, cleaning heads are each mounted for rotation about a vertical axis. The disc itself may be freely rotatable about a central vertical axis thereby substantially or completely offsetting the torque reaction arising from the cleaning heads in use.

The drive means preferably comprises a belt and pulley system which driveably connects an electric motor mounted above the housing to the or each cleaning head.

The sealing means may be positioned on the plate or on the housing to form a barrier to prevent the ingress of unwanted matter such as water or dirt to the belt and pulley system.

Three embodiments of the invention will now be described by way of example only with reference to the accompanying drawings of which:-

Figure 1 shows a partial cross-section through part of a known floor cleaning device,

Figure 2 shows a similar view to that shown in Figure 1 of a floor cleaning device according to a first embodiment of the invention,

Figure 3 shows on an enlarged scale the sealing means of the device shown in Figure 2,

Figures 4 and 5 show on enlarged scales alternative sealing means to that illustrated in Figure 3.

As shown in Figure 1 the known floor cleaning device comprises a housing 1, a disc 2 on which are mounted three rotating cleaning heads 3 (only one shown) each connected by a pulley and belt drive system to a motor 4.

As can be seen in Figure 1 the motor 4 drives a central pulley 5 through a vertical shaft 6 which in turn drives three pulleys 7 (only one shown), each connected to a cleaning head 3 through a belt 8. Each pulley 7 is mounted on a vertical spindle 9 by means of a bearing 10 secured to the disc 2 by fixing bolts 14. The spindle 9 is supported at its upper end 12 by an internal bowl 11. Each spindle 9 extends downward through the disc 2 and an end fitting 13 allows a cleaning head 3 to be mounted at its lower extremity.

The internal bowl 11 is mounted via a bearing 15 on a sleeve 16 separate from but coaxially located with respect to the central drive shaft 6. The bowl extends and is connected to the peripheral edge 17 of the disc 2 and thereby encloses all the pulleys 5 and 7 and the drive belt 8. The disc 2 and internal bowl 11 are freely rotatable on the sleeve 16 thus eliminating the torque reaction which arises by contact between the cleaning heads 3 and the floor 20. A fender 19 is provided at the side 21 of the housing 1.

As shown in Figures 2 and 3 the cleaning device in accordance with the invention is somewhat similar to that shown in Figure 1 and the same reference numerals have been used. However in this construction the side 21 of the housing 1 is formed with a radially inwardly extending ridge 23 which lies vertically above and close to the peripheral edge 17 of the disc 2. This forms a barrier preventing water, dirt and other matter from entering the interior space enclosed by the housing 1 between the edge of the disc 2 and the side of the housing 1 and furthermore from affecting the belt and pulley system located above the disc 2. Thus the radially outer portion of the internal bowl 11 becomes superfluous and is replaced by a disc-shaped member 28 or three-armed spider (not shown) freely rotatable on the sleeve 16 and supporting the upper ends 12 of the spindles 9.

In Figure 3 the radially inwardly extending ridge 23 is shown in more detail. It may be formed by a suitable shaping operation e.g. if the housing is of metal, by spinning, or if plastic, by moulding.

Alternative forms of the sealing means are shown in Figures 4 and 5. In Figure 4 the peripheral edge 17 of the disc is provided with a radially outward extending row of bristles 24 located in a mounting 26 on the underside of the disc. The bristles contact the radially inner surface of the housing 1 thereby forming a barrier. In the construction shown in Figure 5 the row of bristles is replaced by a single elastomeric seal 25 in the form of an annular ring, the radially inner part of the ring being located in a suitable mounting 27 and the radially outer edge rubbing against the radially inner surface of the housing 1.

Claims

1. A floor cleaning device comprising at least one cleaning head (3) mounted for rotation below a substantially horizontal plate (2), drive means (5,7) located above the plate (2) for causing rotation of the cleaning head (3), a housing (1) covering the cleaning head (3), the plate (2) and drive means (5,7), characterised in that sealing means (23;24;25) is located between the housing (1) and the edge of the plate (2) for preventing the ingress of unwanted matter to the drive means (5,7).

2. A cleaning device according to Claim 1, characterised in that a plurality of cleaning heads (3) is mounted on the plate (2).

3. A cleaning device according to Claim 1 or 2 characterised in that the horizontal plate (2) comprises a disc freely rotatable about a central vertical axis.

4. A cleaning device according to any one of the preceding claims characterised in that the drive means (5,7) driveably connects the cleaning head (3) to an electric motor (4) mounted above the housing (1).

5. A cleaning device according to Claim 4, characterised in that the drive means (5,7) comprises a belt and pulley system.

6. A cleaning device according to any one of the preceding claims, characterised in that the sealing means (24;25) is positioned upon the plate (2).

7. A cleaning device according to Claim 5 characterised in that the sealing means comprises a brush (24) mounted on the edge (17) of the plate (2) and extending outwards to contact the housing (1).

8. A cleaning device according, to Claim 5 characterised in that the sealing means comprises an annular elastomeric ring (25) positioned on the edge (17) of the plate (2) and extending outwards to contact the housing (1).

9. A cleaning device according to any one of the preceding claims characterised in that the sealing means (23) is positioned on the housing (1).

10. A cleaning device according to Claim 9 characterised in that the sealing means comprises an inwardly extending ridge (17) positioned to lie in overlapping relationship above the edge (17) of the plate (1).

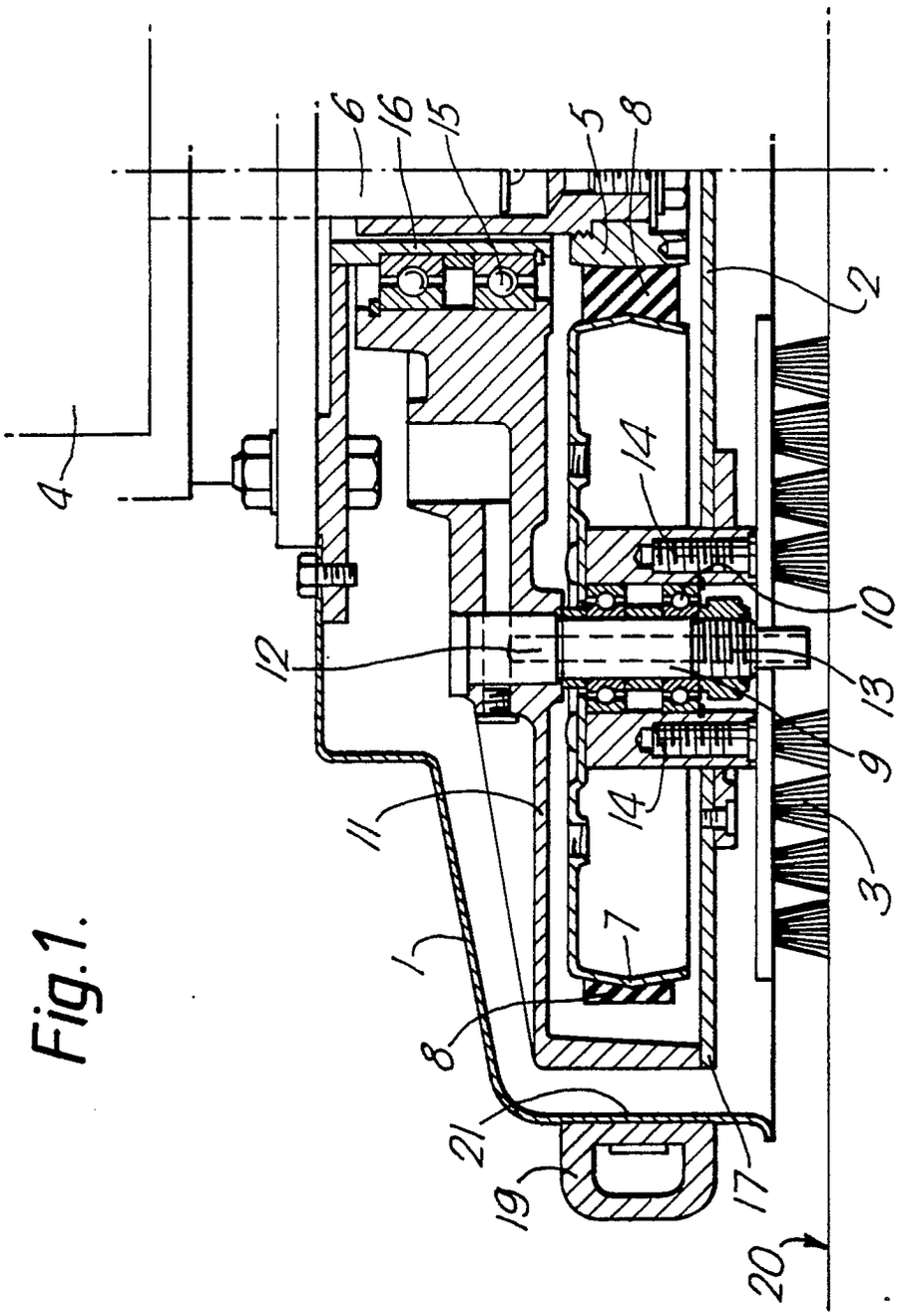


Fig.1.

Fig.3.

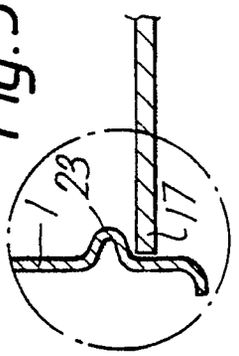


Fig.4.

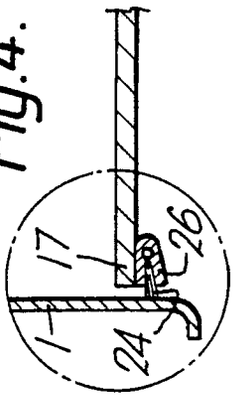


Fig.5.

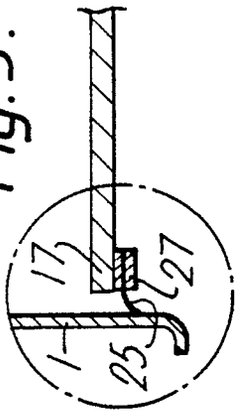
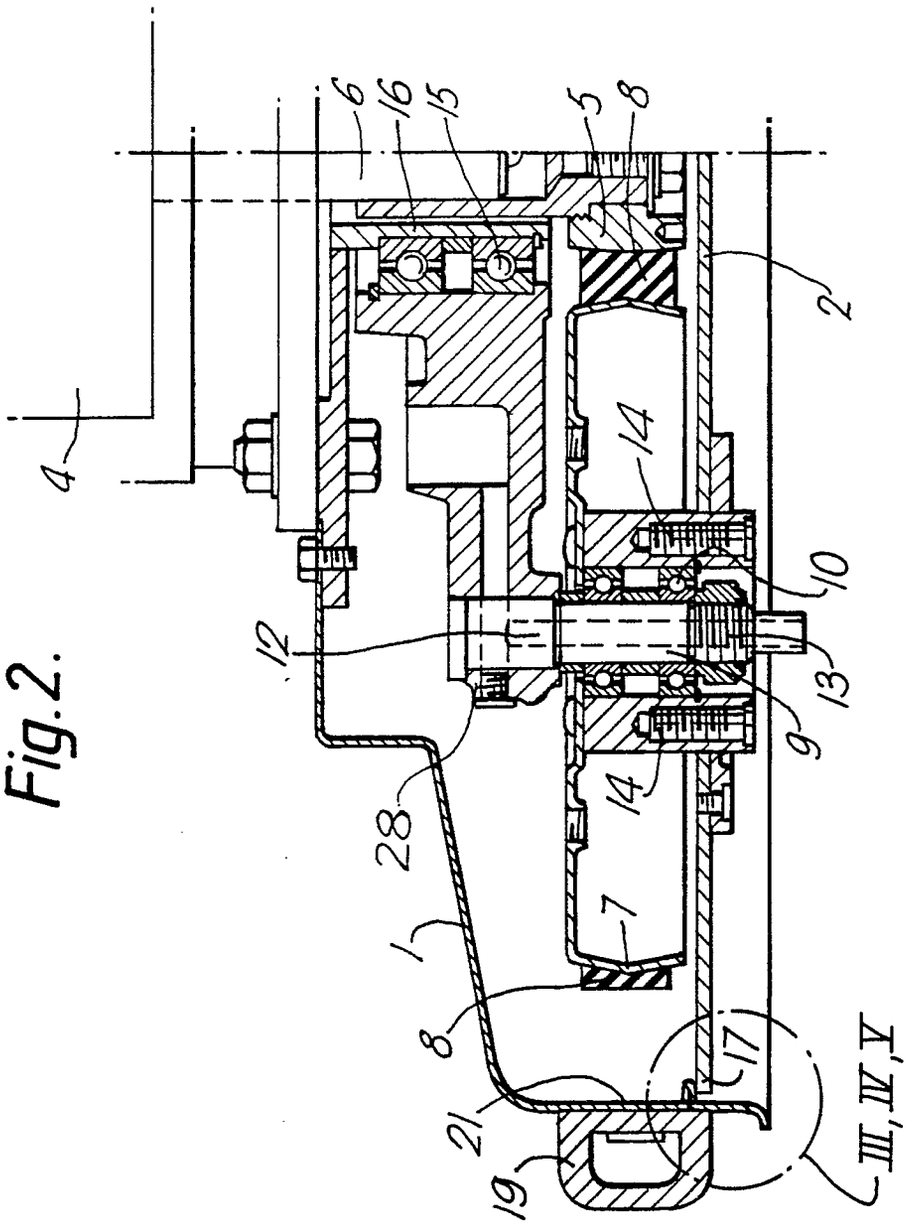


Fig.2.



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EUROPEAN SEARCH REPORT

Application Number

EP 90 30 5151

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	GB-A-657726 (G.W. PATCHETT & STERLING ENGINEERING CY LTD) * page 1, lines 72 - 85; figure 1 *	1, 2, 4, 5	A47L11/16
X	US-A-2986756 (R. DESCARRIES) * column 2, lines 7 - 32; figure 7 *	1, 2, 4, 5	
X	US-A-3169262 (O.L. ALLEN & AL) * column 2, line 63 - column 3, line 2; figure 3 *	1, 2, 4, 5	
A	EP-A-314926 (DULEVO SPA)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 SEPTEMBER 1990	VANMOL M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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