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(54) Abrading drum.

(57) Fitting-device for mounting a cylindrical sleeve of sandpaper over a drum (14) of a sanding machine (10). The drum (14) has an exterior mounting surface which is retractable from a working configuration, in which the surface defines a first circumference and engages and tensions the sandpaper, to a retracted configuration, in which the surface defines a lesser second circumference to permit removal and replacement of the sandpaper.

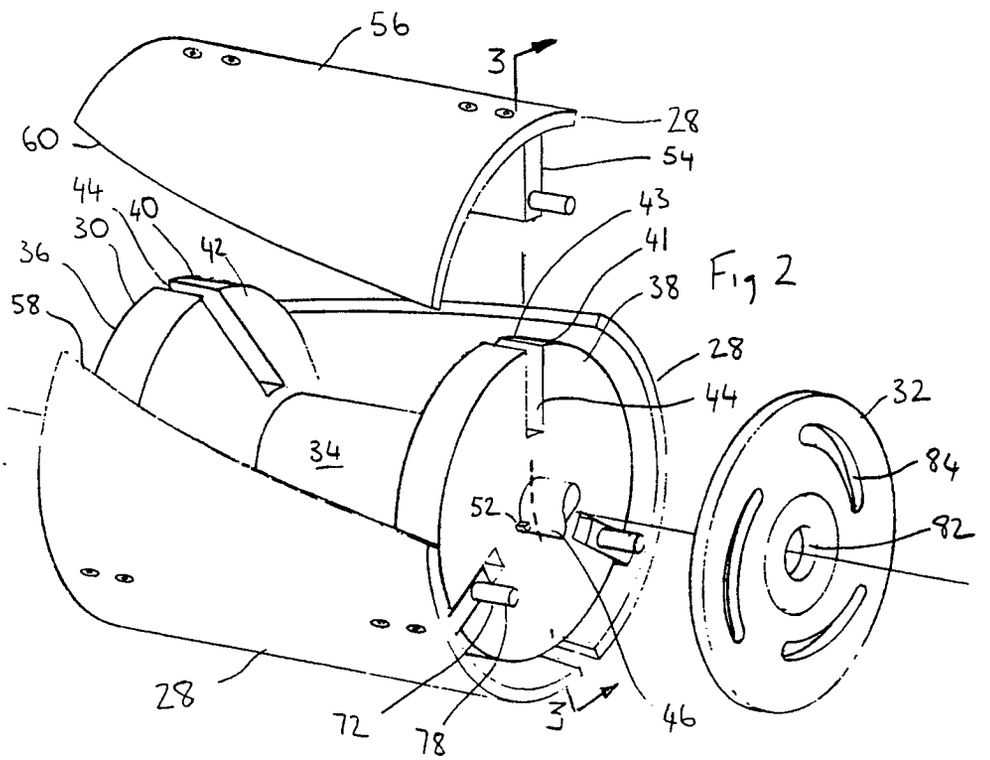

Fig 2

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ABRADING DRUM

FIELD OF INVENTION

This invention relates to an abrading drum, and in particular to sanding drums for use in floor sanding machines.

BACKGROUND OF THE INVENTION

Conventional floor sanding machines include a sanding drum supported on a wheel mounted carriage. The sanding drum may be adjusted to vary the pressure applied by the drum on the floor surface. Drive for the drum is normally supplied by an electric motor which may also drive a vacuum fan for collecting dust produced by the sanding operation.

The sanding drum is, conventionally, a fixed circumference cylinder, the abrasive surface being provided by a rectangular sheet of sandpaper which is secured on the drum by a paper clamp located within an axial slot in the surface of the drum. To change the sandpaper, an operator removes the drum guard from the machine to gain access to the drum and releases the paper clamp to permit removal of the sandpaper. The new sheet of sandpaper is then passed around the drum and its ends positioned in the clamp, which is then tightened to secure the sheet in place. In practice, operators may experience difficulties in correctly tensioning the sheet and the presence of a discontinuity in the sandpaper surface, where the ends of the sandpaper enter the clamp, make it harder to achieve a smooth surface finish.

SUMMARY OF THE INVENTION

According to the present invention there is provided an abrading drum for mounting a continuous loop of flexible abrasive sheet and adapted for mounting about a central axis of an abrading machine, the drum having an exterior mounting surface which is retractable from a working configuration, in which the surface at least partially defines a first circumference and engages and tensions the abrasive sheet to retain the sheet on the drum, to a retracted configuration, in which the surface at least partially defines a lesser second circumference to permit removal and replacement of the abrasive sheet.

Preferably, the exterior surface of the drum is formed of a plurality of radially moveable segments. Further, the edges of the segments preferably extend spirally around the exterior of the drum to provide a smoother abrading action.

BRIEF DESCRIPTION OF DRAWINGS

A preferred embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a floor sanding machine suitable for fitting with an an abrading or sanding drum in accordance with the present invention;

Figure 2 is an exploded view of an abrading or sanding drum in accordance with a preferred embodiment of the present invention;

Figure 3 is a sectional view on line 3-3 of Figure 2;

Figure 4 is an end view of the sanding drum of Figure 2, and a cylindrical sleeve of sandpaper, showing the sanding drum in an extended configuration; and

Figure 5 is a view corresponding to Figure 4, but showing the sanding drum in a retracted configuration.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Reference is first made to Figure 1 of the drawings, which illustrates a typical floor sanding machine 10. The machine is mounted on several ground engaging wheels 12 and is provided with a sanding drum 14, located at the front of the machine. The drum 14 is driven by an electric motor 16 which also powers a fan 18 for collecting dust produced by the sanding operation and directing it through a dust pipe 20 to a dust bag (not shown). The motor 16 drives the drum 14 and fan 18 through a number of drive belts, which, in Figure 1, are hidden by a belt guard 22.

An operator uses the machine 10 to level or polish, for example, wooden flooring and pushes or pulls the machine over the floor surface using a machine handle 24. The pressure exerted by the drum on the floor surface can be adjusted by means of a variable drum pressure control, and access to the drum is gained by means of a hinged drum guard 26, located at the front of the machine.

The sanding drum 14 is illustrated in Figure 2 and comprises three radially moveable segments 28, a bobbin shaped drum body 30 and two end plates 32 (only one shown in Figure 2). As will be described, the provision of moveable segments permits an operator to easily remove and replace a

cylindrical sleeve of sandpaper fitted over the drum 14.

The drum body 30 is formed of an aluminum casting and includes a cylindrical central portion 34 and two end portions 36, 38. The diameter of the end portions 36, 38 is greater than the diameter of central portion 34 and each includes a respective outer cylindrical part 40, 41 and a frusto-conical part 42, 43 which serves as a transition between the respective end parts 40, 41 and the central portion 34. Each end portion 36, 38 is also provided with three radial slots 44 which are aligned with corresponding slots in the other end portion 38, 36.

The drum body 30 is rotatably mounted on the machine 10 by means of an cylindrical axle 46 which extends through the body. If reference is made to Figure 3 of the drawings, it will be noted that the axle is stepped at 48 and is provided with a keying member 50 which engages a complementary slot 52 (Figure 2) in one end of the body 30.

The slots 44 in the end portion 36, 38 of the drum body 30 receive inner portions of the segments 28, in the form of fins 54, which extend radially inwardly into the slots 44. The fins 54 are mounted on the ends of part-annular outer portions 56 which define the outer surface of the drum. There is a narrow spacing between the segments 28 and the leading and trailing edges 58, 60 of the outer portions 56 define a gentle spiral around the exterior of the drum. This allows the drum to apply a substantially constant pressure to a floor surface throughout the full rotation of the drum.

The fins 54 are mounted to the outer portions 56 by pairs of bolts 62 which extend through counter sunk holes 64 into complementary threaded holes 66. The fins 54 each have an outer portion 68 of constant height and a tapering inner portion 70. The fins 54 are of rectangular section and fit snugly within the respective slots in the end portions 36, 38 of the body 30. Pins 72 extend from the fins, beyond the end face of the respective end portion 36, 38. The pins 72 each have an inner threaded portion 74 which engages a complementary threaded hole 76 in the fin 54 and a smooth cylindrical outer portion 78, which extends from the fin and beyond the ends of the drum body 30 to provide cam followers, forming part of cam means for use in moving the segments 28 between an extended configuration and a retracted configuration. The cam means further include the end plates 32, which act as cam plates and are rotatably mounted on each end of the drum body 30.

Each cam plate 32 includes a central aperture 82 through which the ends of the axle 46 extend, and three spiral apertures 84 which provide cam surfaces for the pins 72. The apertures 84, in this particular example, extend radially outwardly in the counter clockwise direction. The plates 32 are held in place on the end portions 34, 36 of the body 30 by small circular retaining plates 86 (Figure 3) which similarly fit over the axle 46 and are secured to the body by bolts 88.

The retraction and extension features of the drum will now be described with reference to Figures 4 and 5 of the drawings. Figure 4 illustrates a drum as it would appear in use, fitted with a cylindrical sleeve of sandpaper 90 (the thickness of the sandpaper has been exaggerated to assist in illustration), of dimensions chosen to suit this particular drum. The segments 28 are fully extended to tension and locate the sandpaper securely around the drum. It will be noted that the plate 32 is positioned at its furthermost clockwise rotational position, with the pins 72 positioned at the ends of the apertures. To remove the sandpaper 90 from the drum, the cam plates 80 are turned in the counter clockwise direction such that the pins 72 follow the apertures 84 and pull the segments 28 inwardly. As shown in Figure 5 of the drawings, the retracted segments are well clear of the sandpaper 90, allowing easy removal and replacement of the sandpaper. Of course, the drum mounting in the sanding machine must be such to allow free access to at least one end of the drum.

Thus it can be seen that the present invention provides a straightforward means for replacing the sandpaper on a sanding machine.

It will be clear to those skilled in the art that the particular embodiment described above is merely exemplary and that various modifications and improvements may be made to this example, without departing from the scope of the invention.

Claims

1. An abrading drum for mounting of a continuous loop of flexible abrasive sheet and adapted for rotatable mounting about a central axis in an abrading machine, having an exterior mounting surface moveable between a working configuration, in which the surface at least partially defines a first circumference and is adapted to engage and tension a continuous loop of flexible abrasive sheet to retain the sheet on the drum, and a retracted configuration, in which the surface at least partially defines a lesser second circumference to permit removal and replacement of the sheet.

2. The abrading drum of claim 1 wherein the exterior mounting surface is formed of a plurality of radially movable segments.

3. The abrading drum of claim 2 wherein cam means is provided on the drum for effecting radial movement of the segments.

4. The abrading drum of claim 3 wherein the

cam means includes a cam member rotatable about the central axis and engaging the segments.

5. The abrading drum of claim 4 wherein each segment comprises an outer portion having a part cylindrical outer surface adapted for engaging a portion of the inner surface of a continuous loop of flexible abrasive sheet and an inner portion for engaging the cam member.

6. The abrading drum of claim 5 wherein the cam member is in the form of an apertured plate, the apertures defining spiral cam pathways, and the inner portions of the segments include elongate cam followers extending into respective cam member apertures.

7. The abrading drum of claim 6 wherein a cam member is provided at each end of the drum and each segment is provided with corresponding elongate cam followers.

8. The abrading drum of claim 5, 6 or 7 wherein the outer portions of the segments are closely spaced and have leading and trailing edges which extend spirally around the outer surface of the drum.

9. The abrading drum of claim 5, 6 or 7 wherein the outer portion of each segment is part annular and each respective inner portion extends radially inwardly from the respective outer portion to be received by a corresponding radial slot in the drum body.

10. The abrading drum of claim 5, 6 or 7 wherein the outer portions of the segments are closely spaced out have leading and trailing edges which extend spirally around the outer surface of the drum and each outer portion is part annular and each inner portion extends radially inwardly from the respective outer portion to be received by a corresponding slot in the drum body.

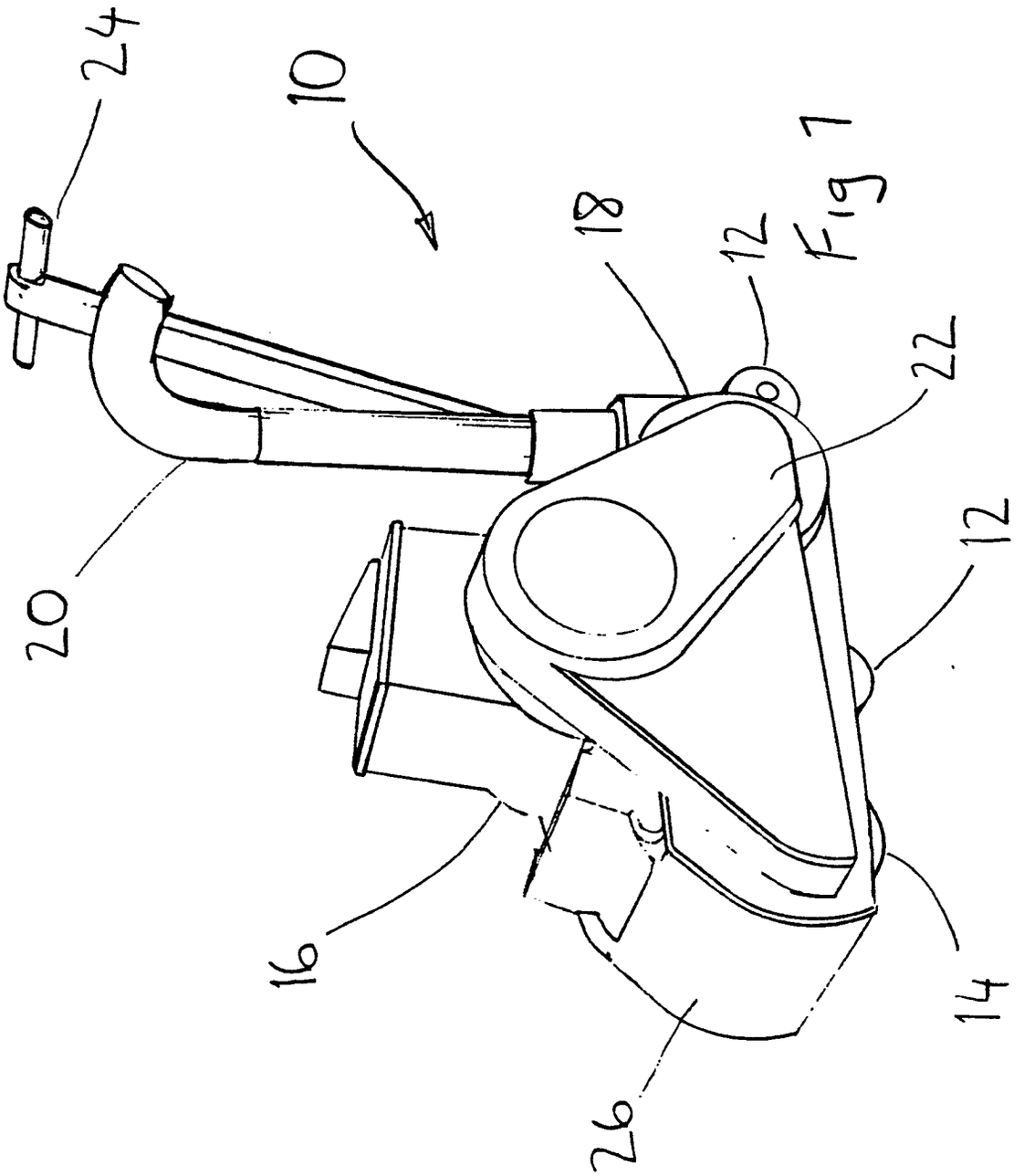

Fig 1

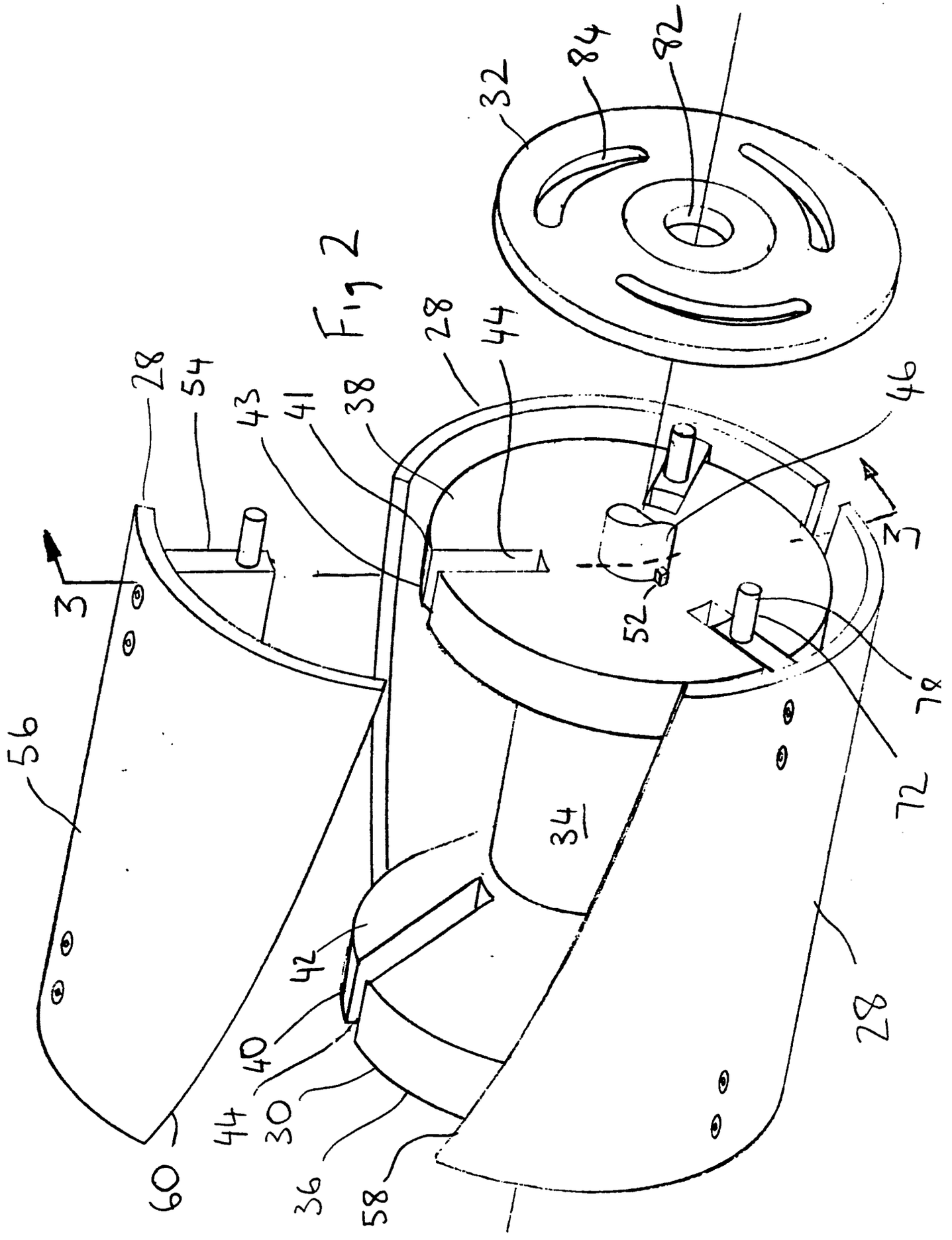
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Fig 2

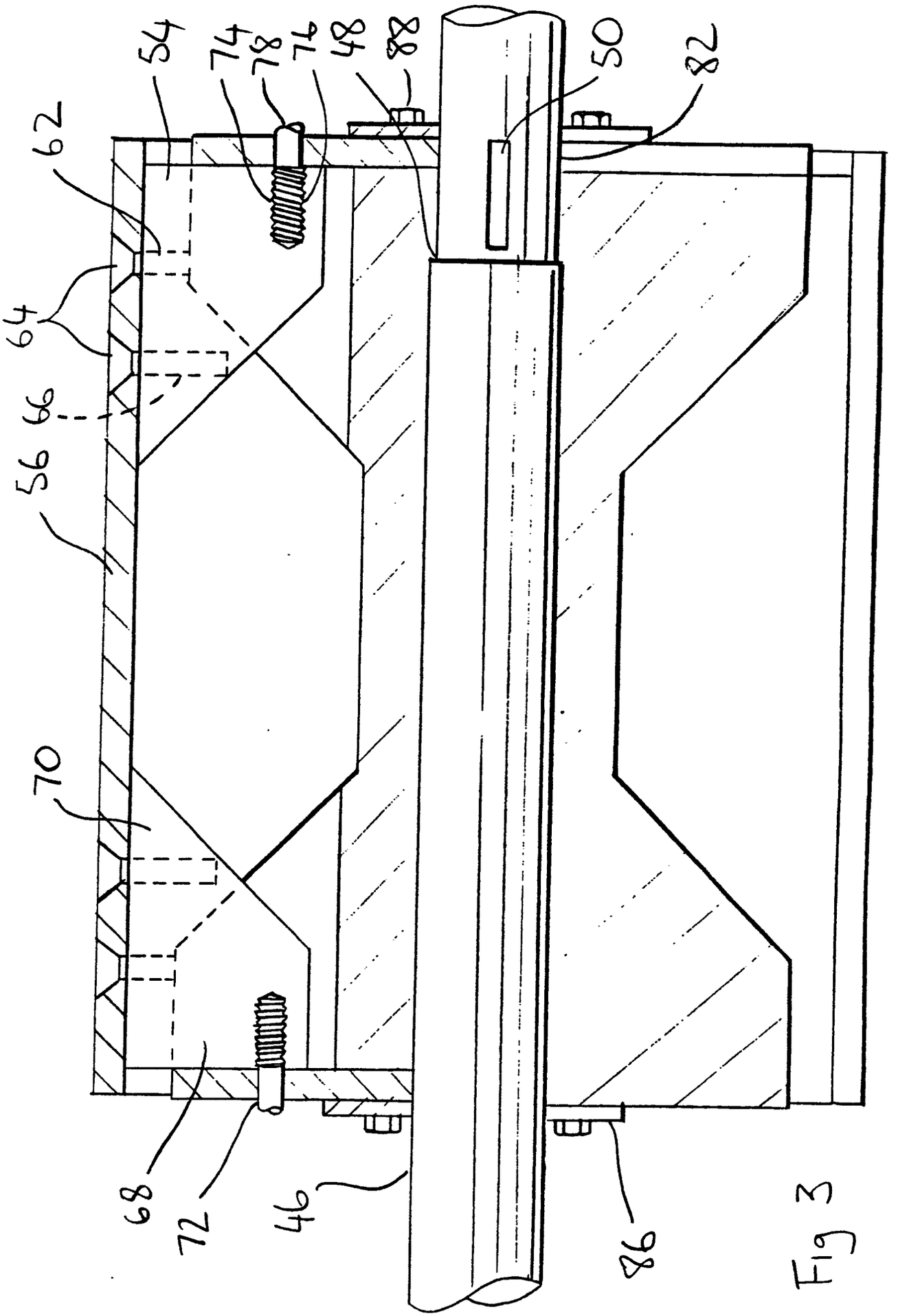
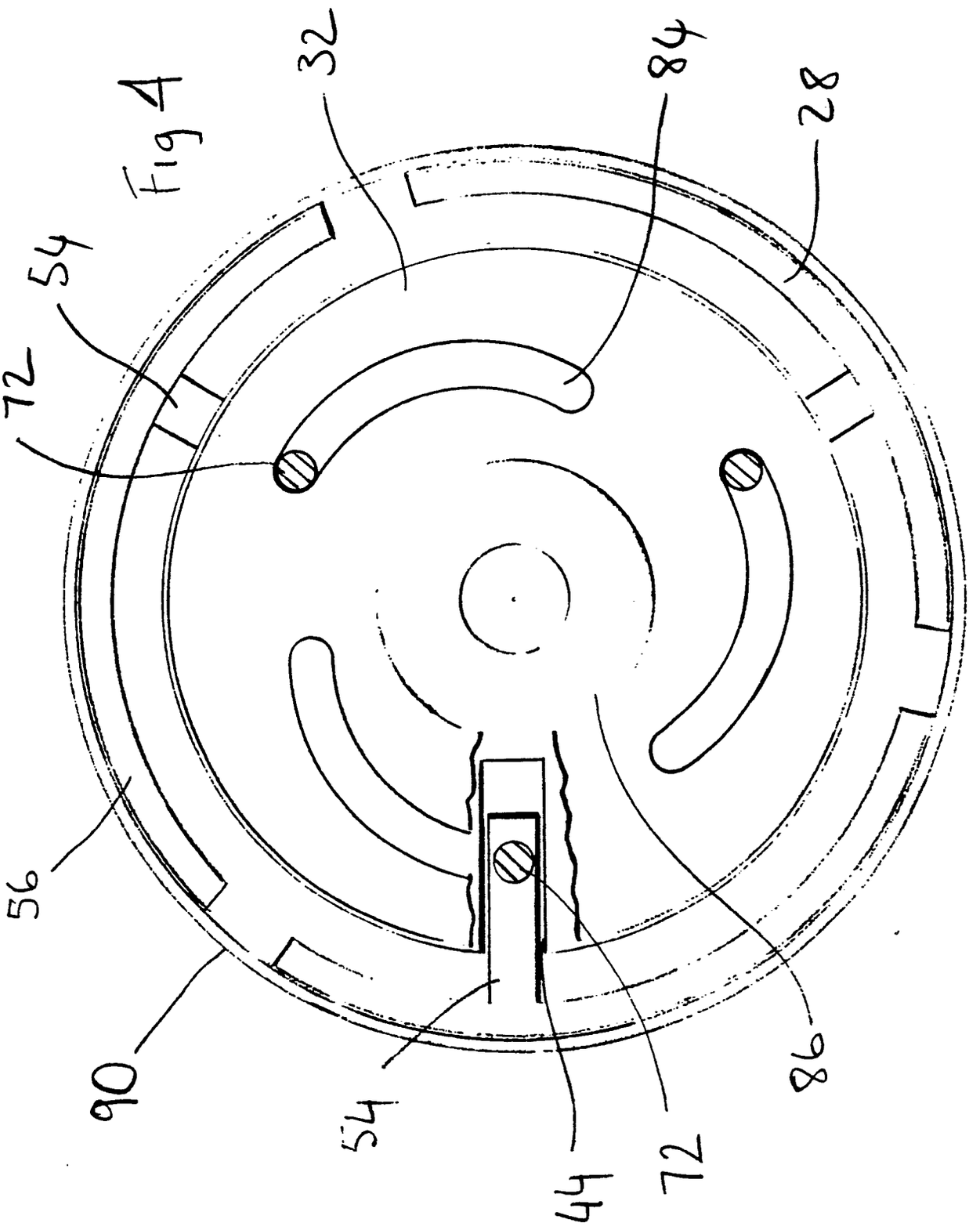


Fig 3

Fig 4



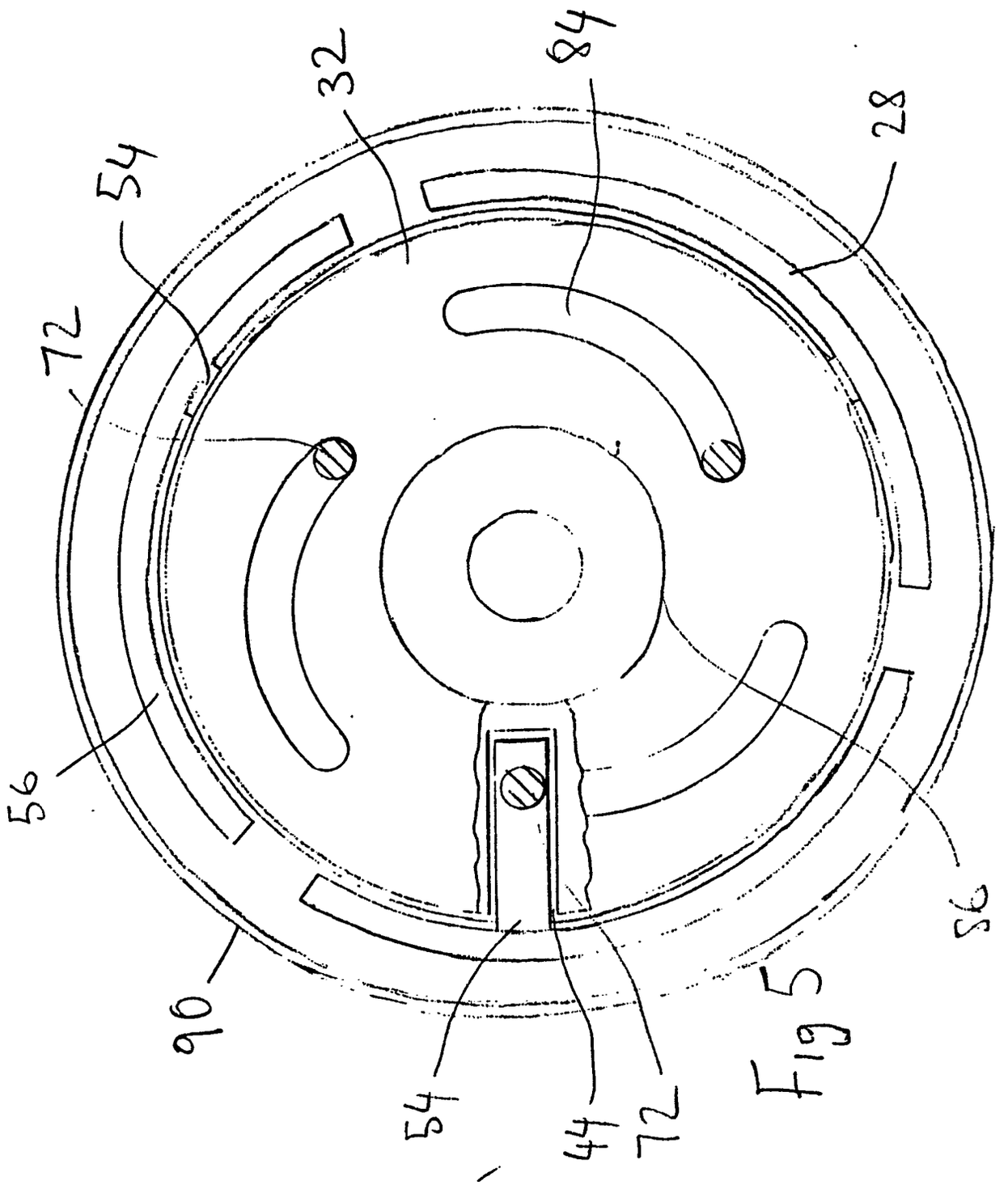


Fig 5

European Patent Office

EUROPEAN SEARCH REPORT

Application number

DOCUMENTS CONSIDERED TO BE RELEVANT

EP 90304480.8

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US - A - 1 240 428 (DUZEY) * Fig. 3,4 * --	1	B 24 B 7/18
A	US - A - 3 039 241 (HOLT) * Fig. 6 * ----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 24 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	13-07-1990	GLAUNACH

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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