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(54) Apparatus for producing cork washers

(57) An apparatus includes cutting means (4) for obtaining diskshaped washers from a semi-manufactured product (2) of natural cork, positioning means (22, 24) provided with a hollow body (22) and controlling means (24) for positioning said semi-manufactured product (2) so that its pores are disposed in a parallel manner with respect to said cutting means (4); the hollow body (22) is associated to lever means (46) oscillating between an external position in which said semi-manufactured product does not interfere with said cutting means (4) and an internal position in which said semi-manufactured product (2) interferes with said cutting means (4).

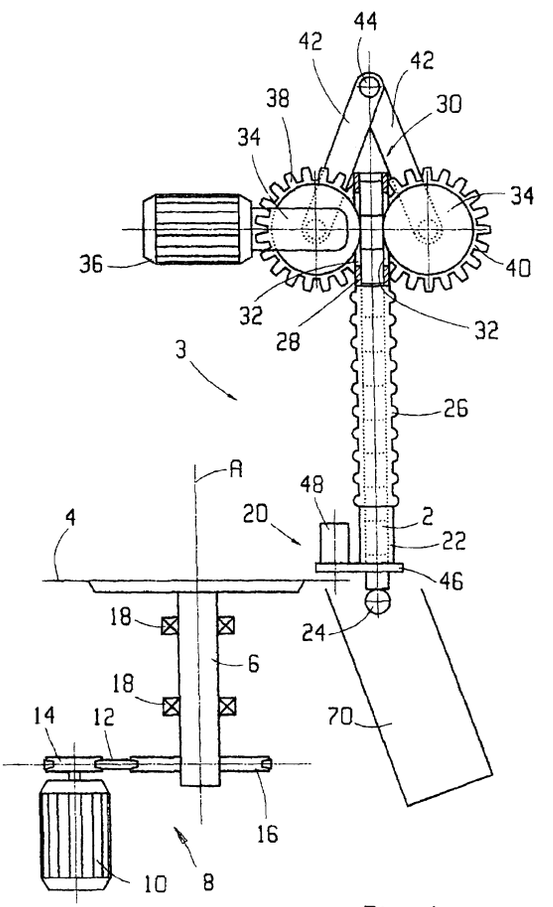

Fig. 1

EP 1 080 856 A1

Description

[0001] The invention relates to an apparatus for producing cork washers, which may be used, for example, in the manufacturing of stoppers.

[0002] In the prior art disk-shaped washers are obtained by punching strips of natural cork and the above-mentioned disk-shaped washers are then applied to one or both the ends of a stopper central element in cork particles agglomerate.

[0003] Sine the traditional washers have a disposition of pores passing through the thickness of each washer, it is necessary to apply two washers at each end of a stopper element in order to obtain a finished stopper offering sufficient sealing assurances.

[0004] EP-A-481155 describes a method for producing a cork stopper constituted by a main body in agglomerated cork and at least a terminal portion in natural cork wherein the pores are disposed in a perpendicular direction with respect to the longitudinal axis of the stopper. In EP-A-481155 the at least one terminal portion is obtained by transversely cutting a bar wherein the pores are disposed perpendicularly to the longitudinal direction of the bar.

[0005] A purpose of the invention is to manufacture, in a very fast and easy way, disk-shaped cork washers.

[0006] According to the invention, there is provided an apparatus including cutting means for obtaining disk-shaped washers from a semi-manufactured product of natural cork, characterized in that positioning means is provided for positioning said semi-manufactured product with respect to said cutting means.

[0007] Preferably, the semi-manufactured product has its pores disposed in a parallel direction with respect to said cutting means.

[0008] In this way disk-shaped washers are obtained from a semi-manufactured product of natural cork in a very practical and easy way.

[0009] Furthermore, it is possible to work defective stoppers of natural cork by using them as semi-manufactured products from which disk-shaped washers may be obtained, stoppers that otherwise would have to be discarded. That is particularly interesting in view of the high cost of the raw material and its limited availability in nature.

[0010] The invention makes possible to obtain the stoppers of EP-A-481155, or stoppers constituted by gluing together a certain number of natural cork washers as defined above, i.e. having the pores disposed in a parallel direction with respect to the thickness of each washer.

[0011] The invention can be better understood and carried into effect with reference to the enclosed drawings which illustrate, by way of a non-limiting example, a way of carrying the invention into effect, wherein:

Figure 1 is a schematic frontal view of an apparatus for cutting cork stoppers for obtaining disk-shaped washers;
Figure 2 is a top view of the stopper cutting region;
Figure 3 is a vertical section, enlarged and broken, of the stopper cutting region;
Figure 4 is a vertical section, enlarged and broken, of the stopper filling region;

[0012] As shown in Figure 1, an apparatus for cutting cork stoppers 2, having substantially cylindrical shape, includes a circular blade 4 supported by a shaft 6 driven to rotate on bearings 18 around a vertical axis A by an engine 10 through a transmission 8 including a belt 12 wound around a driving pulley 14 keyed on the output shaft of the engine 10 and around a driven pulley 16 fixed to the shaft 6.

[0013] Near a peripheral edge region of the blade 4 a feeding unit 3 is provided comprising support means 20 suitable to internally receive the stoppers 2 to be cut in a vertically disposed bottom hollow body 22, upward and downward open in order to allow the stoppers 2 approaching the cutting peripheral border of the blade 4 to pass through said hollow body.

[0014] Downward the outlet of the bottom hollow body 22 controlling means 24 is provided in order to stop the movement of the plugs 2 during the cutting operation, as will be explained here below more in detail.

[0015] The bottom hollow body 22 has its upper end coupled to a flexible conduit 26, preferably a wrinkled tube, extending up to the outlet of a top hollow body 28, vertically disposed as well with a top inlet 30 in communication with a loader of stoppers 2, for example including a hopper container, not shown.

[0016] The upper hollow body 28 is provided with a pair of opposing slots 32 through which respective dragging rollers 34 are partially inserted, said rollers causing the stoppers 2 to advance along the conduit 26 and the bottom hollow body 22.

[0017] The dragging rollers 34 are driven to rotate around the respective horizontal axis by a motor-reducer 36 which operates a driving toothed-wheel 38 fixed to one of the dragging rollers 34 and engaging a driven toothed-wheel 40 fixed to the other dragging roller 34.

[0018] The dragging rollers 34, the driving and driven toothed-wheels 38, and 40, and the motor-reducer 36 are suspended to a pair of connecting-rods 42 hinged to a pin 44 being part of a fixed body frame, not represented.

[0019] As shown in Figures 2, 3 and 4, the bottom hollow body 22 is fixed to a lever 46 which may oscillate around a pin 48 between an external position wherein the stopper 2 nearest the blade 4 is not in contact with the blade itself and an internal position wherein the same stopper is completely cut by the action of the blade 4. The lever 46 is moved in the direction shown by the arrow F from its external position to its internal position by a pneumatic operating cylinder 50 connected to an appendix 52 of the lever 46. In addition, on the lever 46 a sliding stop push-rod 54 is mounted, operated by a

further operating pneumatic cylinder 56 disposed in such a way as to penetrate through the bottom hollow body 22 in order to stop the fall of the stoppers 2 along the duct 26.

[0020] The controlling means 24 includes a set of freely rotatable wheels 58 supported on a support pin 60 defining a rotation axis B of the wheels 58 as explained later more in detail.

[0021] The group of the lever 46 with respective hinge pin 48 and operating pneumatic cylinder 50 is supported by a slide 62 sliding on guides 64 and adjustable in position through a controlling screw 66 that can be operated by the knob 68.

[0022] Near the region wherein the stoppers 2 are cut by the blade 4 a discard duct 70 of the cut washers and, in a backward position with respect to the discard duct 70 and to the rotation way V of the blade 4, a further discard duct 72 of the defective washers are provided.

[0023] The operation comes in the following manner: The stoppers 2 are caused to fall along the duct 26 by the combined action of the dragging rollers 34 which slightly compress each stopper 2 in a transversal direction and push it toward the bottom hollow body 22; therefore a stack of stoppers 2, which is pressed against the controlling means 24 with a predetermined pressure, is formed into the duct 26.

[0024] When the lever 46 is caused to oscillate from its external position to its internal position, the stopper 2, which lies supported on the controlling means 24, is led to interfere with the blade 4 and a disk-shaped washer is obtained from the stopper. Since the pressure caused by the action of the dragging rollers 34 is kept on the stack of plugs, when the lever goes back to its starting external position, the cut washer is thrown along the way V of the blade 4 motion and falls into the discard duct 70.

[0025] When, on the contrary, the washer must be discarded, because for example it does not comply with the expected thickness, the further cylinder 56 is operated and the stop push-rod 54 intervenes on the stack of stoppers 2 freeing the cut washer from the pressure which normally is applied on it by the stack itself. Therefore, the disk-shaped cut washer follows the back movement of the lever 46 towards its external position and falls into the further discard duct 72 of the defective washers.

[0026] In order to improve the productivity of the apparatus, it is possible to arrange around the same blade 4 a plurality of feeding units 3.

Claims

1. Apparatus, including cutting means (4) in order to obtain disk-shaped washers from a semi-manufactured product (2) in natural cork, characterized in that, positioning means (22, 24) is provided in order to position said semi-manufactured product (2) with respect to said cutting means.

2. Apparatus according to claim 1, wherein said positioning means includes a hollow body (22) in which said semi-manufactured product can be inserted.

3. Apparatus according to claim 2, wherein said hollow body (22) is associated to lever means (46) oscillating between an external position in which said semi-manufactured product (2) does not interfere with said cutting means (4) and an internal position in which said semi-manufactured product interferes with said cutting means (4).

4. Apparatus according to any of the preceding claims, wherein said positioning means (22, 24) further includes controlling means (24) disposed at the outlet of said hollow body.

5. Apparatus according to claim 4, wherein said controlling means (24) includes at least one wheel (58) free to rotate around an auxiliary support pin (60).

6. Apparatus according to any of the preceding claims and further comprising feeding means (26, 28, 32, 34, 36, 38) feeding said semi-manufactured product (2) towards said cutting means (4).

7. Apparatus according to claim 6, wherein said feeding means (28, 32, 34, 36, 38) includes flexible duct means (26) interconnecting said hollow body (22) with a further hollow body (28).

8. Apparatus according the claim 6, or 7, wherein said feeding means (26, 28, 32, 34, 36, 38) includes advancing means (32, 34, 36, 38) for advancing said semi-manufactured product (2) towards said cutting means (4).

9. Apparatus according to claim 8, wherein said advancing means (32, 34, 36, 38) includes roller means (34) inserted in slots (32) of said further hollow body (28).

10. Apparatus according to claim 9, wherein said roller means is operated by motor-reducer means (36) through a gear transmission (38).

11. Apparatus according to any of preceding claims and further comprising stop means (54, 56) for stopping the fall of said semi-manufactured product towards said cutting means (4).

12. Apparatus according to any of preceding claims and further comprising a discard duct (70) for discarding the cut washers and a further discard duct (72) discarding the rejected washers.

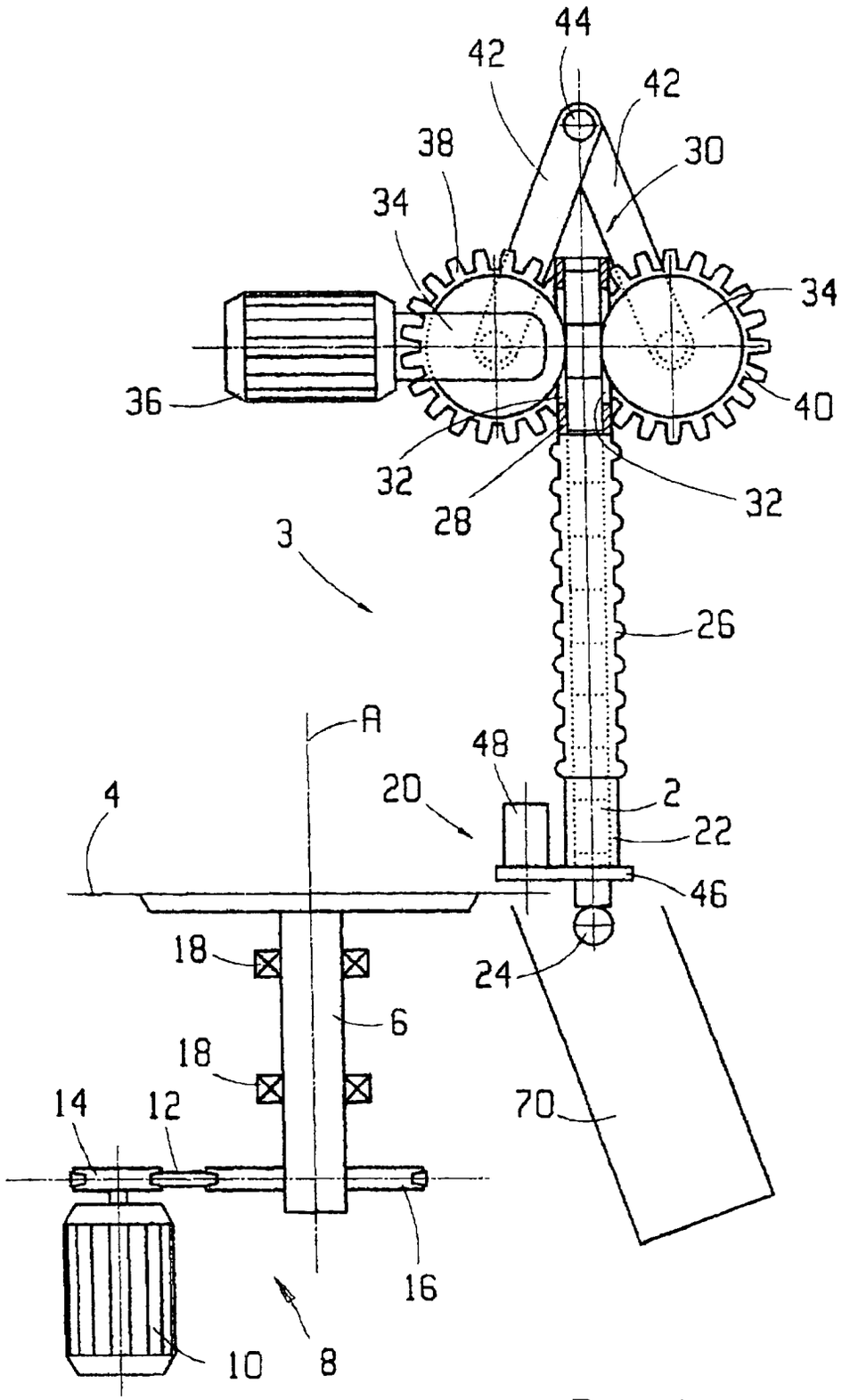
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Fig. 1

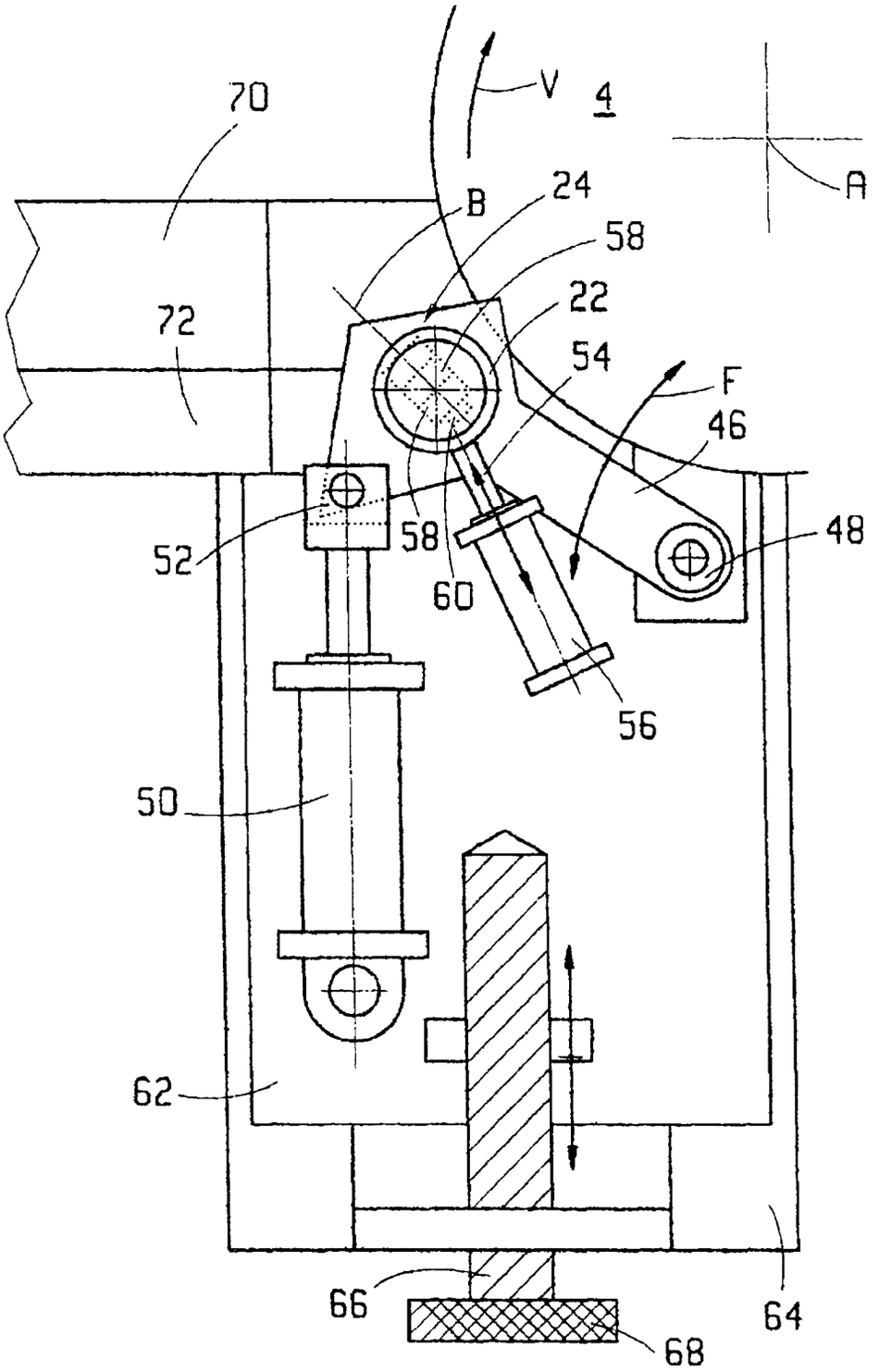

Fig. 2

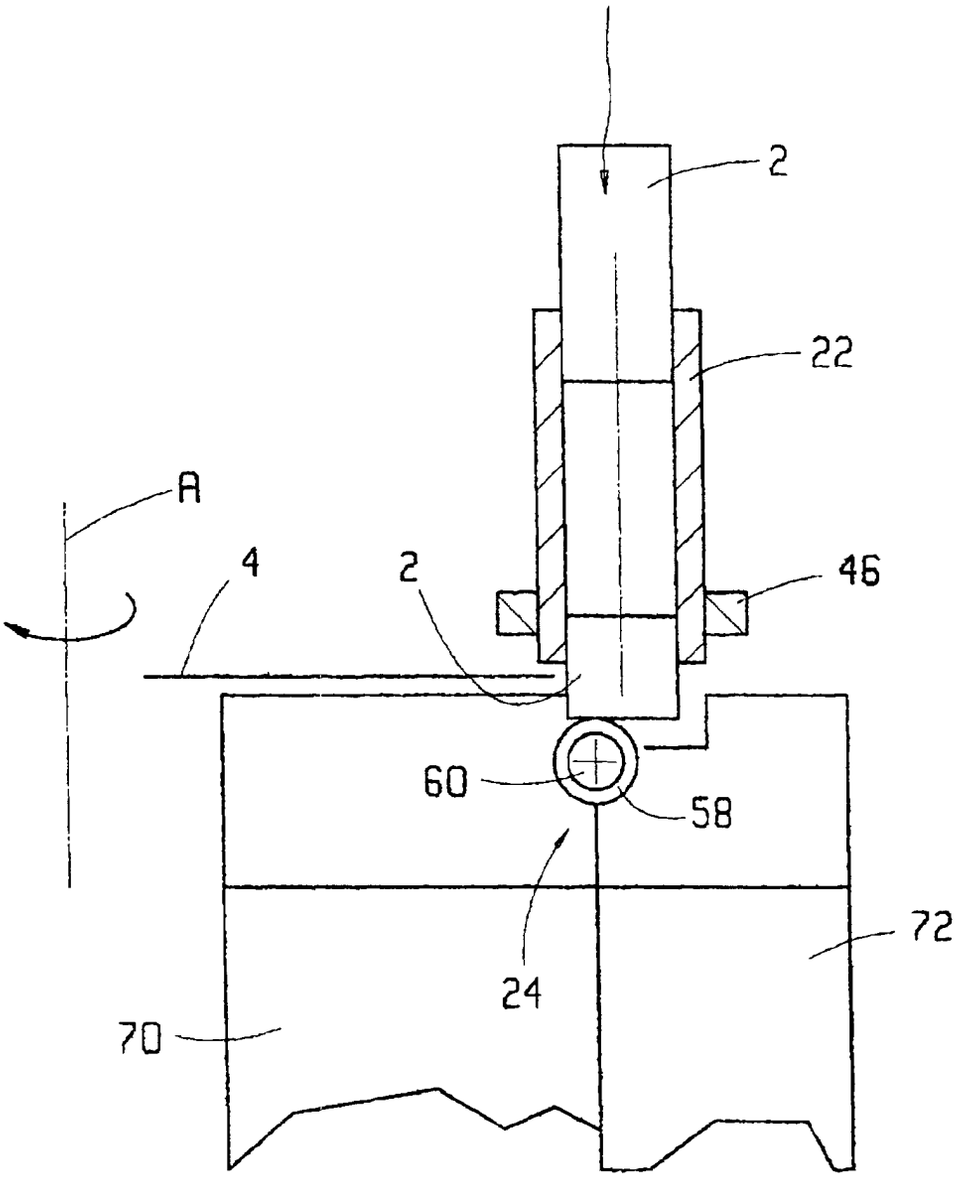

Fig. 3

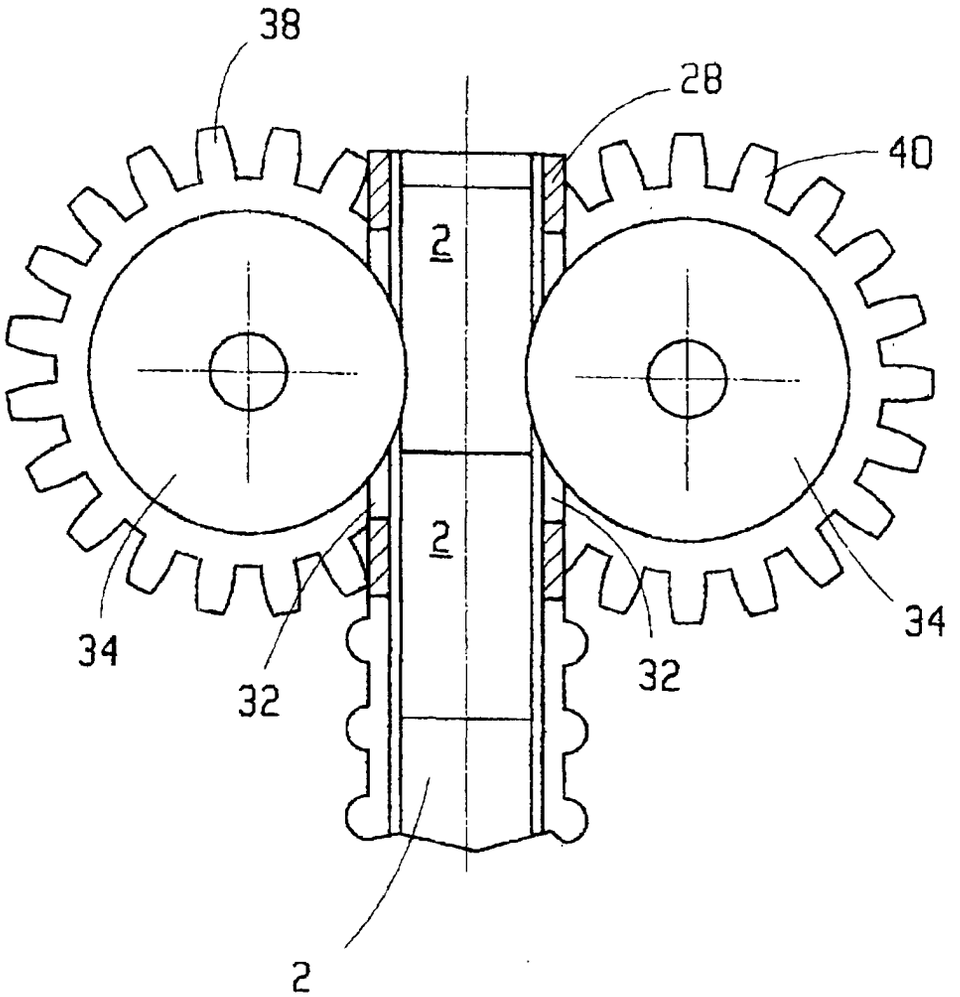

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 99 11 7034

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X Y	DE 200 371 C (DITTMER) * the whole document *	1-4 11	B27J5/00 B26D1/147
Y	IT 1 162 489 B (MECC COMSU F LLI SATTA SDF OFF) 1 April 1987 (1987-04-01) * page 3, last paragraph; figure 1 *	11	
X	US 3 194 289 A (LUNDELL) 13 July 1965 (1965-07-13) * column 2, line 32 - line 49 * * column 3, line 34 - line 54; figures 7,8 *	1-4	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 December 1999	Huggins, J

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EUROPEAN SEARCH REPORT

Application Number
EP 99 11 7034

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
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