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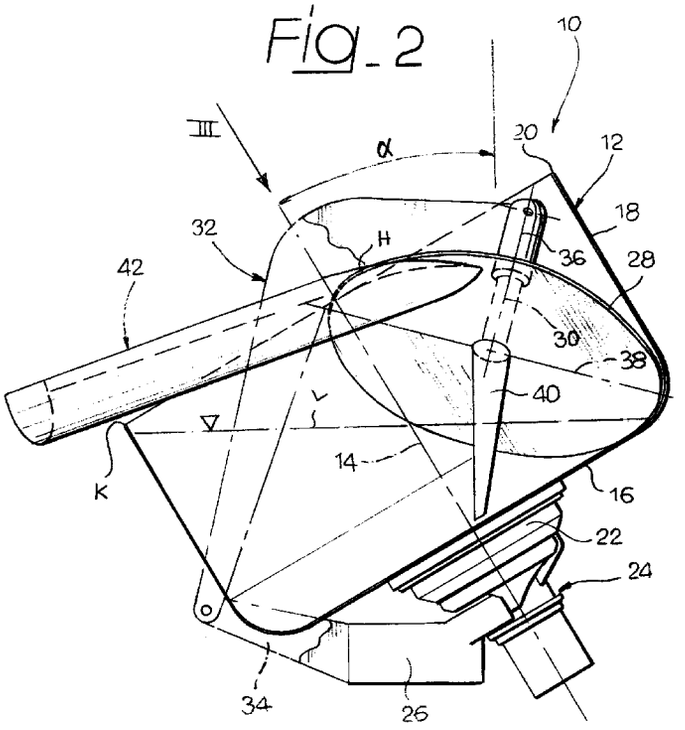
(54) A mixing device, in particular for preparing concrete or the like

(57) A mixing device comprising a motorized and rotatable container (12) having a charging mouth (20). Within the container (12) is arranged an idle disk (28) inclined with respect to an horizontal plane and arranged so that in use it is in part immerged and in part above the level (L) of the product to be mixed.

Fig_2



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Description

[0001] The present invention relates to a mixing device, in particular for preparing concrete or the like.

[0002] Mixing devices can be classified in mixers with fixed or movable casing. The present invention relates specifically to a mixing device with movable casing, according to the preamble of claim 1.

[0003] Mixing devices with movable casing of the more common type present a rotatable motorized container having an open mouth for charging the products to be mixed, sometimes used also for discharging the mixed product by inclinating the container. Within the rotatable container are generally provided formations for entraining the product to be mixed, which are fixed to the container.

[0004] The present invention has the object to provide a mixing device which is simple, with the least possible number of components and which has an improved mixing capacity with respect to the conventional mixers.

[0005] According to the present invention, this object is achieved by a device having the features forming the subject of the claims.

[0006] The device according to the invention will now be described in detail with reference to the annexed drawings, given purely by way of non-limiting example, wherein:

- figure **1** is a schematic perspective view of a mixing device according to the present invention,
- figure **2** is a side elevation view of the device of figure 1, wherein the container has been sectioned,
- figure **3** is a view according to arrow III of figure 2, and
- figure **4** is a perspective view from a different angle of the device of figure 1.

[0007] With reference to the figures, a mixing device intended in particular for the preparation of concrete or the like is indicated at 10.

[0008] The device 10 comprises a container 12 rotatable about its axis 14. The container 12 has a bottom wall 16 and a lateral wall 18 which in the example shown in the figures has a cylindrical shape, whose axis is coincident with the axis of rotation 14. The end of the cylindrical wall 18 opposite to the bottom wall 16 is open, so as to form a charging mouth 20.

[0009] As shown in figure 2, on the external side of the bottom wall 16 of the container 12 is located a support 22 fixed to the output shaft of a geared motor assembly 24 which is carried by a stationary base 26. The geared motor assembly drives in rotation the container 12 about the axis 14. The axis of rotation 14 is preferably arranged with an inclination α with respect to a vertical direction (figure 2) which is comprised approximately between 20° and 36°.

[0010] An idle mixing disk is placed within the container 12 and is free to rotate about its axis of symmetry 30. The disk 28 is carried by a support arm 32 placed outside the container 12 and connected to the stationary base 26, for example by means of a pair of parallel flanges 34. The support arm 32 has preferably a bracket configuration and carries at its free end a hub 36 on which the disk 28 is mounted.

[0011] The disk 28 is contained in a plane which is inclined with respect to a horizontal plane of an angle comprised between 0° and 20°. The support arm 32 could be provided with an adjustment mechanism of any known type, adapted to permit a regulation of the angle of inclination of the disk 28. In alternative, the disk 28 could be in an invariable position and means could be provided for adjusting the position of the container 12. The container 12 could also be overturned to permit a rapid discharge of the mixed product. Adjustment of the relative angular position between the disk and the axis of rotation of the container could be advantageous for adapting the device to the characteristics of the product which is intended to be mixed. However, this adjustment is not indispensable and in the simplest embodiment of the device according to the present invention the disk 28 and the container 12 are in an invariable relative position.

[0012] In order to define the relative position of the disk 28 with respect to the container 12 it is convenient to imaginary devide the container 18 with a plane passing for the axis of rotation 14 and orthogonal to the plane of a representation of figure 2. In this way, the container 12 presents an upper section and a lower section. The disk 28 is placed substantially tangent to the internal wall of the upper section of the container 12. The inclined disposition of the disk 28 is such that the diagonal 38 formed by the interception of the plane of the disk with the plane of figure 2 is inclined upwardly in the direction which goes from the wall toward the centre of the container 12. Furthermore, the zone of the disk 28 placed towards the centre of the container 12, indicated at H, is at a level with respect to the ground which is higher with respect to the lower point of the mouth 20, indicated at K. In this way, a part of the disk 28 will always the above the level of the material to be mixed, since this level could never exceed the level of point K. In figure 2 it is indicated at L a generic level of the material to be mixed contained in the container 12. The disposition of the disk 28 is such that in operation the part of the disk 28 adjacent to the wall of the container 12 is immerged in the material to be mixed while the part of the disk 28 placed towards the centre of the container 12 is above the level L.

[0013] In operation, the rotation of the container 12 about the axis 14 imparts to the material to be mixed a rotation about the same axis. Since a part of the disk 28 is immerged in the material in movement, the disk 28 is brought into rotation about its axis 30 by the friction contact with the moving material. In order to increase the entrainment action of the disk 28 by the material, the disk 28 could by provided with an entrainment blade 40

fixed to the disk 28 and projecting from the lower surface of the latter. The entrainment blade 40 is preferably inclined with respect to the axis of rotation 30 of the disk 28 and is placed so that it does not interfere with the walls of the container 12.

[0014] As stated above, the material to be mixed is maintained in movement by the rotation of the container 12 and entrain in rotation the disk 28 about the axis 30. The upper surface of the disk 28 collects therefore a certain quantity of material in the zone wherein the disk is immerged in the material to be mixed.

[0015] The rotation of the disk transports the material collected on the upper surface of the disk above the level L. The material placed on the upper surface of the disk 28 is intended to fall beyond the edge of the disk in the zones wherein the disk is raised with respect to the level L of the material to be mixed. This continuos action of raising and falling from above of the material produces a mixing action much more efficient than the one which is obtained only with the rotation of the container 12.

[0016] At the end of the mixing treatment, the material can be discharged from the device 10 by placing a channel-shaped chute 42 below the disk 28. The channel-shaped chute 42 extends above the lowest point K of the container 12 and is carried by a support structure which is not shown in the figures. The channel-shaped chute 42 is removed during mixing and is inserted below the disk 28 only when the mixing is over and it is necessary to evacuate the mixed material. A part of the material which is raised above the level L by virtue of the rotation of the disk 28 falls on the chute 42 and flows downwardly outside the container 12 where it is collected for the subsequent use.

[0017] The device according to the present invention could be modified in various way with respect to the embodiment disclosed and illustrated. For example, the container 12 could have a different shape since the cylindrical profile of the lateral wall is not essential for carrying out the invention.

Claims

1. A mixing device, in particular for preparing concrete or the like, comprising a rotatable and motorized container (12) having a charging mouth (20), characterized in that it comprises an idle disk (14) arranged within the container (12) so that in use it is in part above and in part below the level (L) of the material that be mixed.

2. A mixing device according to claim 1, characterized in that the disk (28) is contained in a plane inclined with respect to a horizontal plane of an angle comprised between 0° and 20°

3. A mixing device according to claim 1, characterized in that the axis of rotation (14) of the container (12) is inclined with respect to a vertical direction of an angle approximately comprised between 20° and 36°.

4. A mixing device according to claim 3, characterized in that the container (12) has a bottom wall (16) fixed to a support (22) connected to the output shaft of a geared motor assembly (24) carried by a stationary support base (26).

5. A mixing device according to claim 4, characterized in that said disk (28) is mounted in a freely rotatable way at the end of an arm (22) carried by said stationary support base (26).

6. A mixing device according to claim 1, characterized in that it comprises an entrainment blade (40) fixed to the disk (28) and projecting from the surface thereof facing in the container (12).

7. A mixing device according to claim 1, characterized in that it comprises a chute (42) for evacuating the mixed product, arranged in an inclined position below a zone (H) of the disk (28) and above a zone (K) of the mouth (20).

Fig_1

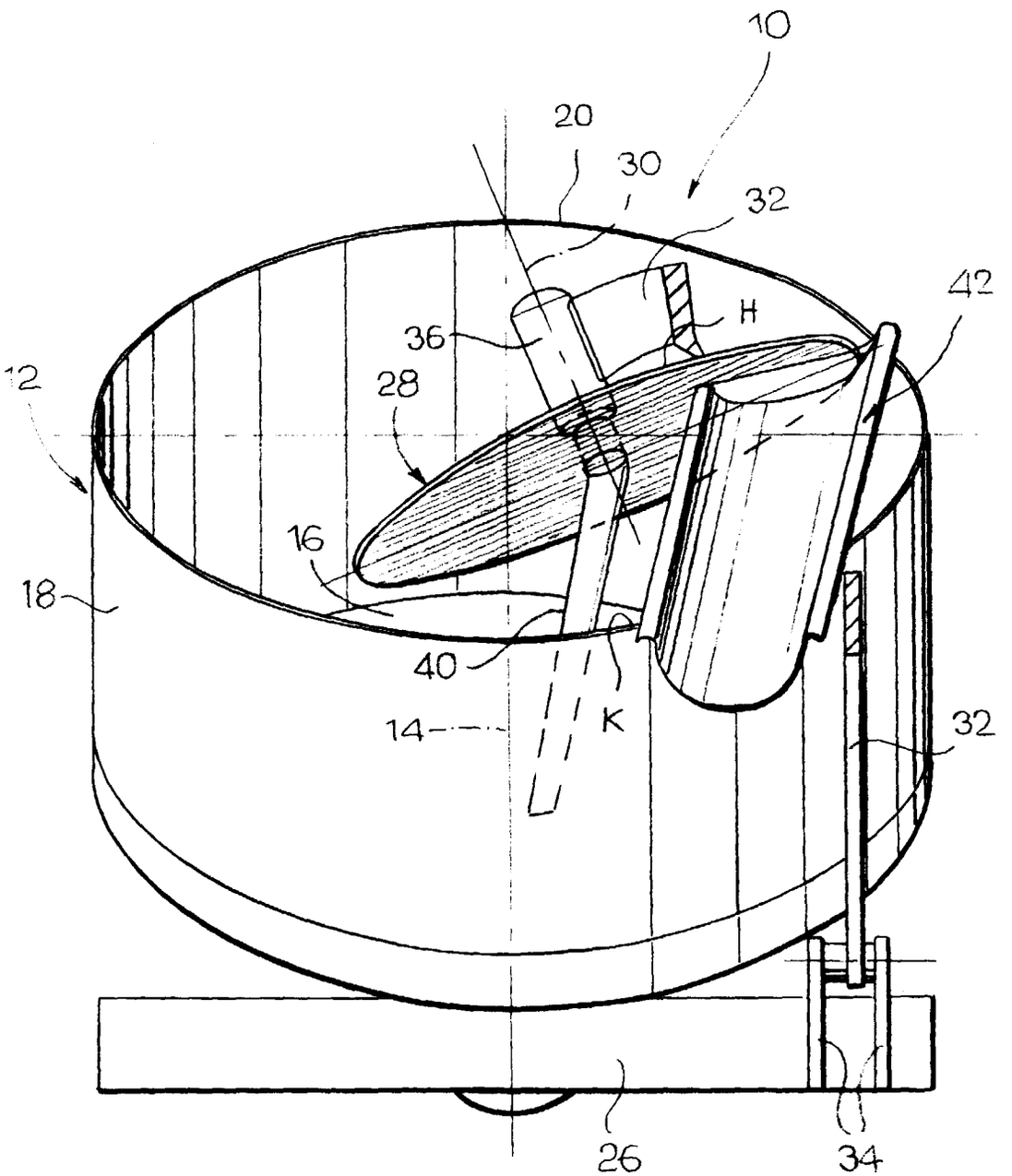


Fig_2

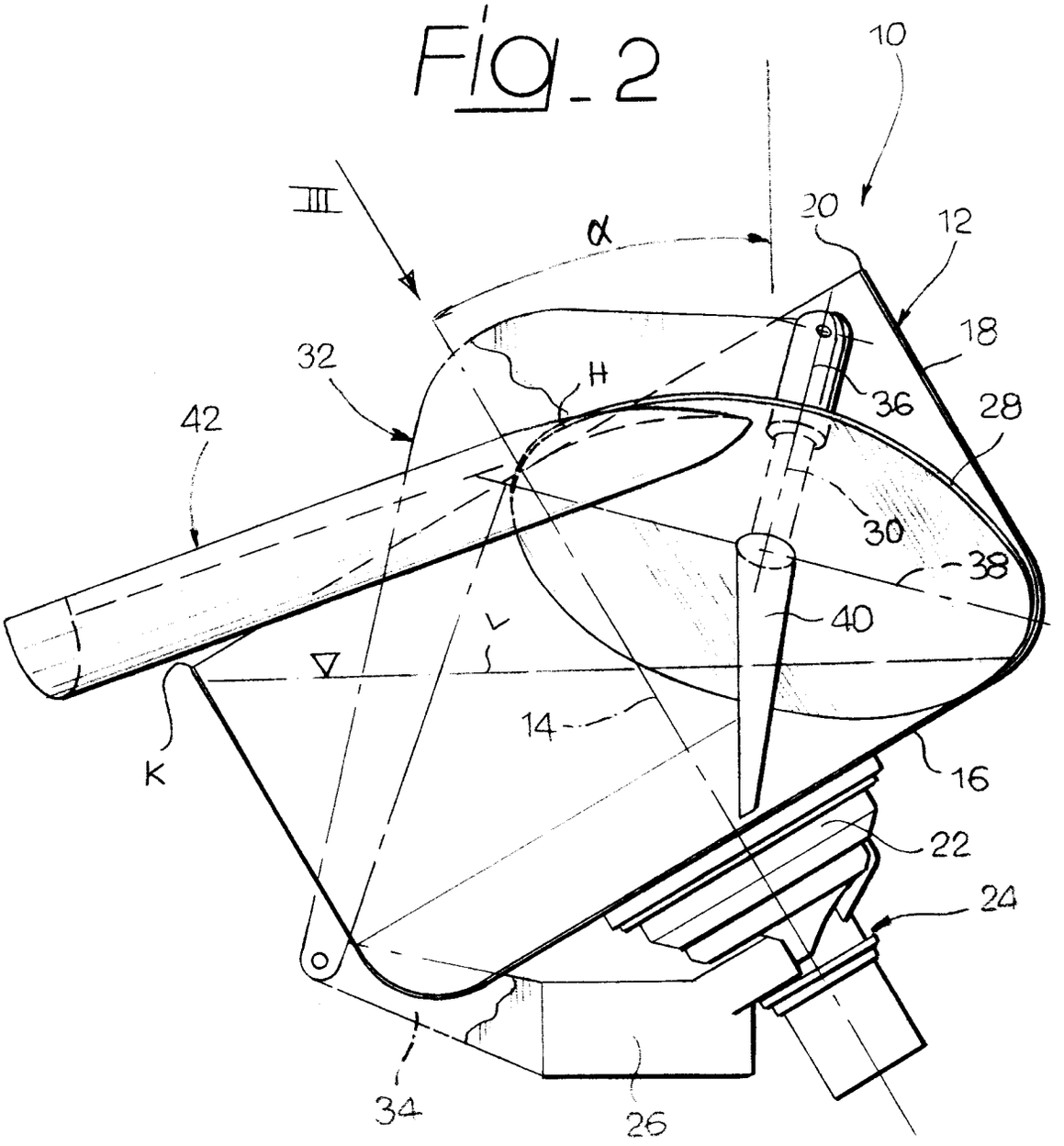


Fig. 3

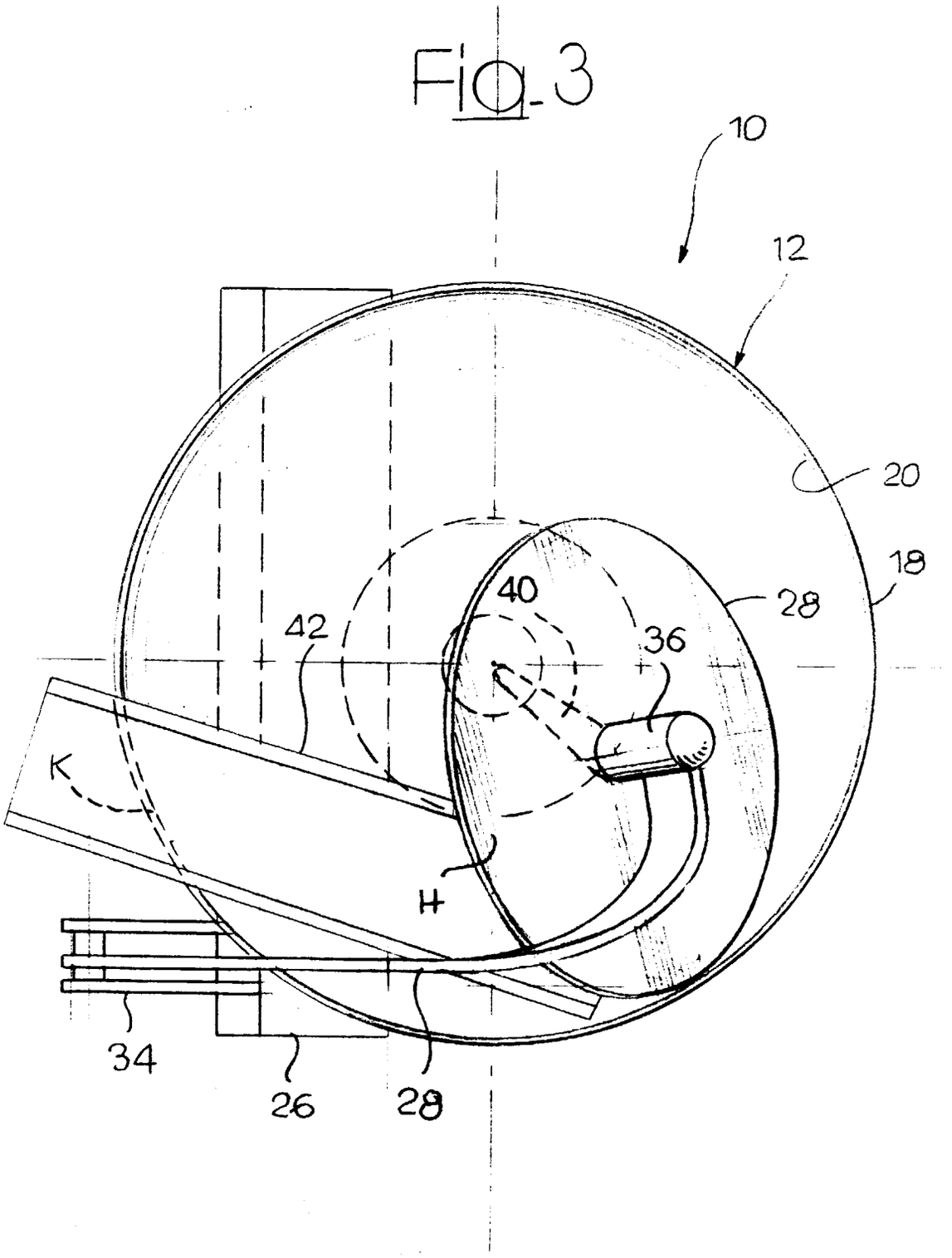
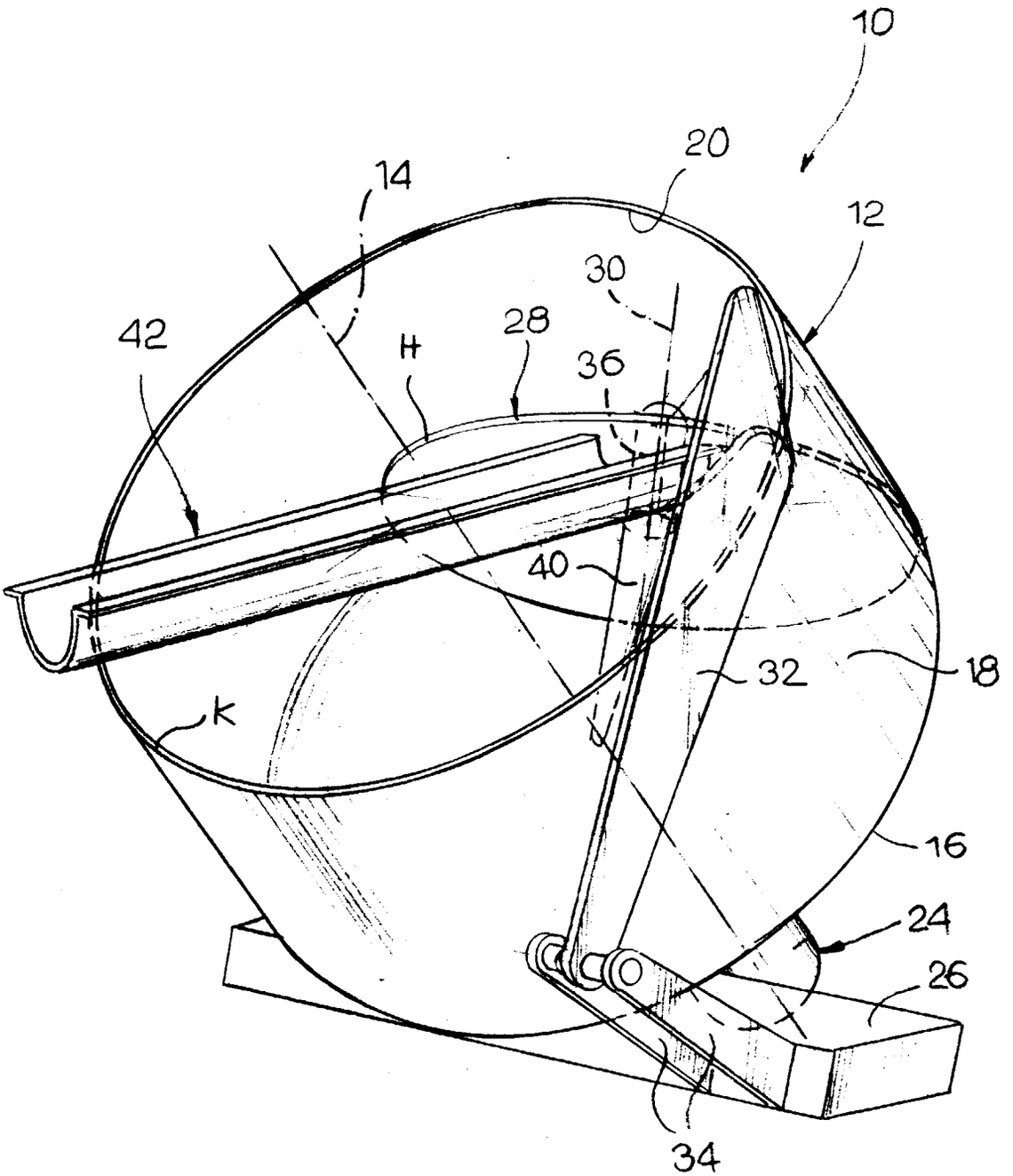


Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 98 83 0146

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.6)
X	DE 510 548 C (MOSER) 16 June 1929 * claim; figures * * column 1, line 10 - column 2, line 2 *	1-3	B28C1/00 B28C5/18
A	GB 638 766 A (WINGET) 14 June 1950 * claims; figures *	1	
A	FR 1 143 532 A (BAULT) 2 October 1957 * the whole document *	1-3	
A	GB 333 492 A (WEITZ) 14 August 1930 * figure 1 *	1-3	
A	GB 248 658 A (MITCHELL) 11 March 1926 * figures 1,2 *	1-3	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B28C
B01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	21 August 1998	Dugdale, G

CATEGORY OF CITED DOCUMENTS

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