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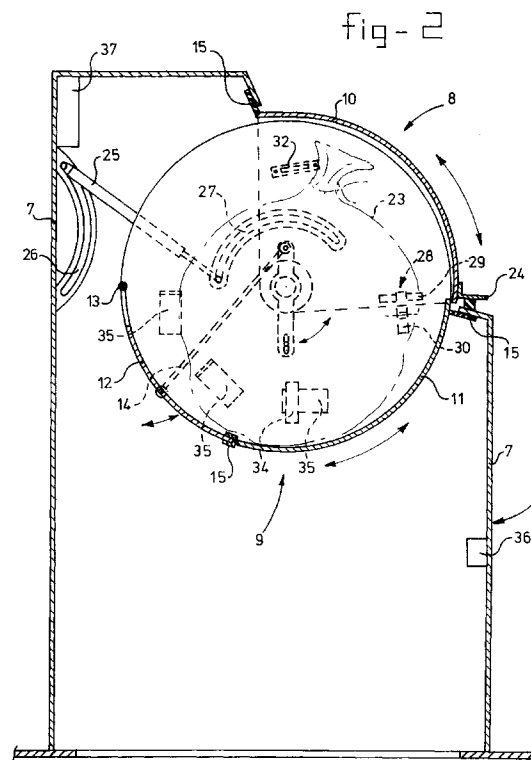
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(54) Filling-lock chamber for a refuse storage unit

(57) Filling-lock-chamber (6) for the individualized introduction of domestic refuse. It comprises an outer shell (10) which is able to close off a filling opening (8) and an inner shell (11) which is able to close off a discharge opening (9). These components are accommodated in a housing (7) which, by way of example, is placed above a storage unit (4).

According to the invention, the inner shell can be coupled to the outer shell, in such a manner that the inner shell is connected to the outer shell starting from the closed position of the latter. When the outer shell is opened, the inner shell will continue to close off the filling opening while simultaneously opening the discharge opening. When the outer shell is completely open, the inner shell is uncoupled therefrom and moves back in the sense of closing off the discharge opening. The refuse can then be introduced and, during the closure of the outer shell, the latter is coupled to the inner flap again.



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Description

The present invention relates to a device for the individualized introduction of objects, such as household refuse, comprising an introduction opening which can be closed off by a drum-shaped outer flap, a drum-shaped inner flap which interacts with the drum-shaped outer flap and is able to open a discharge opening to a store, such as a household-refuse store, the interaction between outer flap and inner flap being such that when the introduction opening is open the inner flap closes off the discharge opening, in order in this way to define a limited introduction volume.

Devices of this nature are placed on containers, which may or may not be arranged beneath the ground, for containing domestic refuse. These devices are provided with locks which optionally interact with cards or other systems, with payment being made for each filled drum. This may take place on the basis of the number of drums filled, but also on the basis of the weight placed in the drum.

Various authorities are seeking to charge the users of such devices in a manner which is as far as possible individualized for the domestic refuse discharged by the users, in order in this way to promote environmental awareness amongst the population. It has been found that when using devices of this nature the users will attempt as far as possible to separate domestic refuse into different streams, certain streams being paid for at a lower rate or even being free.

Although devices of this kind are satisfactory, there are mechanical problems with operating the drums. In the prior art, the inner flap and outer flap are designed so as to rotate concentrically one inside the other, and the various movements are realized by providing a geared transmission between the outer flap and inner flap. This arrangement, on the one hand, has to be of particularly robust design and, on the other hand, comparatively simple to operate, since it is undesirable for external energy to be supplied in order to facilitate operation.

It has been found that in the long term the movement mechanisms for the outer flap and inner flap fail. This is caused in particular by the abrupt ending of the opening or closing travel of the outer flap. The inner flap, which is arranged so that it is concentrically connected to the outer flap via gear wheels, has to dissipate the energy which is stored therein within a very short time, which in the long term leads to damage. Moreover, the fact that the drums rotate inside one another leads to them becoming jammed. If large tolerances are observed, thus reducing the risk of them becoming jammed in this way, it is inevitable that odour will emerge from the store, which is a problem in particular at high temperatures. Moreover, vermin are more easily able to reach the store. Another problem which makes it difficult for the movement of the outer flap and inner flap to run easily is that under high loads it is no longer possible to

ensure that the bearing support for the various drums, which bearing support is arranged in the housing, is accurately aligned. This means that these movements become more difficult, with the result that bearings are subject to high loads. Providing the housing with a stronger design leads to a disproportionately high increase in the costs and, in the long term, does not solve this problem. This is because in a number of designs, the introduction device, together with the store, is periodically lifted with the aid of a crane and the waste is removed from the underside of the store. During this lifting, the housing is subjected to a high level of loading, with the result that slight deformations may occur.

The object of the present invention is to avoid the above-described drawbacks and to provide a structure with which, on the one hand, individualized introduction is possible but, on the other hand, the service life of the two drum-shaped flaps and the associated bearings is increased considerably, while the structure does not become so heavy that it is difficult for certain people to operate the outer flap in a simple manner. Moreover, it must be possible for a system of this kind to be easy to combine with electronic access systems in order to make it possible to receive, and in particular weigh, domestic refuse in an individualized manner.

This object is achieved in the case of a device described above in that the inner flap and outer flap can be coupled to one another in such a manner that during the first part of the opening travel the inner flap is connected to the outer flap in the sense of closing off the introduction opening by the inner flap, that during the second part of the opening travel the inner flap is uncoupled from the outer flap and moves in the sense of opening the introduction opening, and that during closure of the outer flap the latter is coupled to the inner flap.

The invention is based on the insight of no longer coupling the outer flap and inner flap rigidly to one another, but rather of coupling them only over certain parts of the opening or closing path of the outer drum. This means that starting from the closed position of the outer flap, during a first part of the opening travel of that flap, the introduction opening is not opened, owing to the inner flap moving with the outer flap. Also, during this movement, the discharge opening is exposed, so that domestic refuse which is still situated in the two drum halves can be discharged into the store. On approaching the limit position of the outer flap, i.e. the completely open position, the inner flap is uncoupled from the outer flap and moves "back", i.e. into the position in which it blocks off the discharge opening. In this position, the introduction opening is open and domestic refuse can be introduced into the chamber which is delimited between the two drum halves. Then, the outer flap is closed and, at the end of the closure path, is coupled to the inner flap. During these movement steps, there is no question of large quantities of kinetic energy building up as a result of the inertia effect, which energy is converted into

deformation at the end of a travel movement and could ultimately lead to the device failing. The structure described above is not only particularly wear-resistant, but can also be made in a particularly simple and inexpensive manner while maintenance, such as lubrication, is not required. Assembly is easy. Owing to the fact that inner flap and outer flap no longer move past one another, the problems of inner flap and outer flap becoming jammed to one another no longer exist, and low tolerances can be used, so that a better sealing action against odour pollution can be achieved and the self-cleaning effect can be realized in a simple manner.

According to an advantageous embodiment of the invention, the coupling between the inner flap and the outer flap is preferably achieved by means of a lock. A lock of this nature can be controlled electrically or mechanically. In the case where it is controlled electrically, a position sensor for either the outer flap or the inner flap needs to be present, while in the case of mechanical control it is necessary in whatever way for a projecting surface to be present for uncoupling the inner flap and outer flap on reaching the opening position of the outer flap.

As a result of the structure which is now proposed, there is considerable freedom in positioning various components. It is no longer necessary to design the inner flap and outer flap to rotate exactly concentrically inside one another. As a result, these components may take a form which differs from the drum shape, but this is not currently preferred. According to an advantageous embodiment of the invention, the inner flap and outer flap are arranged so as to rotate about essentially the same axis. In an embodiment in which it is important to determine the weight of the domestic refuse which is placed in the device, the inner flap which, after the outer flap has closed, supports the domestic refuse, is preferably provided with at least one axle journal which is supported on a weighing element. In order to avoid problems relating to errors introduced by the bearing, it is proposed to design the bearing for the axle journal as an elongate slot which extends essentially vertically. As a result, horizontal guidance is provided and the inner drum is ultimately supported on the weighing element.

With the design described above, it is possible to design inner flap and outer flap with the same diameter, with the result that a seamless, uninterrupted unit is formed in the closed, i.e. locked, position.

If, in certain applications, the weight of the inner or outer flap is too high to be operated by everyone, it is possible to provide auxiliary means which assist with the rotational movement of the flaps. Consideration may be given here to gas springs and the like.

It will be understood that the device described above can be combined with all electronic devices which are known in the prior art for feeding objects, such as domestic refuse, in a metered manner and recording and charging for them. Moreover, the device described above may be provided with a transmitter or the like,

with the result that data transmission takes place at the moment at which the store which is associated with this device is emptied. As a result, it is impossible to add additional material, such as domestic refuse emanating from other sources, to the lorry into which the store is emptied, during or after the emptying operations. Moreover, it is possible in this way to check when the lorry in question emptied the store in question.

The invention will be explained in more detail below with reference to an exemplary embodiment depicted in the drawing, in which:

Fig. 1 shows a diagrammatic view, partially in cross-section, of the device according to the invention combined with a store for domestic refuse;

Fig. 2 shows a side view, in cross-section, of the device according to the invention in the closed position of the outer flap;

Fig. 3 shows the device in accordance with Fig. 2 with the outer flap in the open position and the inner flap still locked;

Fig. 4 shows the device in accordance with Fig. 2 and 3 with the outer flap open and the inner flap moved back; and

Fig. 5 shows details of the mounting for the inner flap and outer flap.

In Fig. 1, 1 denotes a storage device for domestic refuse. In the example, the actual store 4 is arranged in an opening 3 in the ground 2. Store 4 is provided with a pivotable cover 5 which, after store 4 has moved out of opening 3 in a manner not shown in more detail, can be pivoted open during emptying into a lorry in order to discharge the domestic refuse situated inside the store. An introduction 6 which forms the actual device according to the application is arranged on top of store 4.

As will be clear on studying the remaining figures, this device comprises a housing 7 which is provided with an introduction opening 8 and a discharge opening 9. Introduction opening 8 is closed off by an outer flap 10, while discharge opening 9 is closed off by an inner flap 11. A plate 12 is present which, via a hinge 13, is connected to housing 7. Plate 12 is moved into the position shown in Fig. 2 with the aid of rod 14. The end is provided with a sealing strip which is able to interact with the outer surface of inner flap 11. This plate 12 will move downwards when the inner flap 11 moves upwards, in order to be able to introduce large objects into the store 4 (Fig. 5).

The outer drum is provided with two axle journals 16 which are supported in a bearing block 17. Bearing block 17 may comprise any material which is known in the prior art, but preferably consists of a self-lubricating material such as "material A". This is a self-lubricating nylon material. It can be seen from the drawings, and in particular Fig. 5, that the bearing is provided with a constriction for supporting the axle journals 16. This is such that in the event of the mutually opposite bearing blocks

17 becoming displaced slightly with respect to one another, rotation of the outer flap is not actually impeded. Bearing blocks 17 are attached to housing 7 via bolts 18.

Inner flap 11 is provided with axle journals 19. The position of the inner flap with respect to the outer flap is fixed with the aid of rings 20. Axle journals 19 move inside a vertical slot-shaped opening 21 which allows vertical movement of, for example, 2 cm but at least 1 cm, but limits horizontal movements. In this case, the position of the slot-shaped opening 21 with respect to weighing elements 22 is such that, under normal conditions, the inner flap always rests on the weighing element 22 and not on the bottom of slot-shaped opening 21.

A slot 26 is formed in the housing. One end of gas spring 25 engages therein. This gas spring 25 is connected, at the other end, to the outer flap 10 via a slot 27 which is formed therein. While the outer flap is moving to and fro, the gas spring, depending on its position, is situated in various positions with respect to the outer flap, with the result that the heaviest part of the travel of the outer flap is always supported by the positive action of the gas spring.

A lock 28 is shown, comprising a lock member 29 arranged on outer flap 10 and a lock member 30 arranged on inner flap 11. In the example shown here, this is a mechanically acting lock which is actuated by projection 32.

A hydraulic damper 31 is present on which a projection 33, which is arranged on the side wall of the inner flap, strikes in the limit position at the start of the return movement.

It can be seen from Fig. 1 that there is a card-reader 36 which is connected to the control system 37. Moreover, there is a transmitter 38, which is also connected to control system 37. Control system 37 comprises a memory for storing the number of operations performed. This can take place on an individualized basis, so that it is precisely known when the user last introduced domestic refuse. Control system 37 regulates an electrical locking coil 34 which is arranged on housing 7 and successively engages on three projections 35 on the outer flap 10.

The device described above operates as follows:

Starting from the position illustrated in Fig. 2, the outer flap 10 is closed by locking coil 34 and associated projection 35, and domestic refuse lying in the chamber delimited between outer flap 10 and inner flap 11, on top of inner flap 11, is illustrated by bag 23. A user approaches card-reading device 36 or any other access device. After the data which he has input has been checked and accepted, a lock (not shown in more detail) between coil 34 and projection 35 is released, so that outer flap 10 can be moved upwards by taking hold of handle 24, which may optionally be provided with a rubber buffer block. In this case, each projection 35 can move freely past coil 34. Lock 28 is active, so that during the upwards movement inner flap 11 moves with it, with the result that discharge opening 9 is opened, partly by opening plate

12, and bag 23 falls into store 4. On approaching the end of the travel of outer flap 10, the situation will be similar to that illustrated in Fig. 3. Despite having been opened by outer flap 10, introduction opening 8 will be completely blocked by inner flap 11. In this situation, the lock members 28 and 29 are unlocked, i.e. uncoupled, by the action of projection 32 on lock 28. Inner flap 11 moves back. This movement is decelerated by projection 33 striking damper 31, so that sufficient time remains to discharge bag 23. It is possible for a further projection, which damps the end of the movement of inner drum 11, to be present. The result is the situation shown in Fig. 4. Now, the introduction opening 8 is free, while the discharge opening is closed off, and the user can introduce domestic refuse. After having filled the chamber delimited by the inner flap and the outer flap, the user will then close the outer flap, locking taking place between locking members 29 and 30. During the closure operation, outer flap 10 is moved in steps along housing 7 past successive projections 35 and coil 35, resulting in the initial position shown in Fig. 2.

The transmitter 38 shown in Fig. 1 becomes active in particular when emptying store 4. At that time, the data present in control system 37 are either transmitted to a central processing unit or are taken over by the electronics present in the refuse vehicle intended for this purpose.

The gas spring 25 described above ensures that the action of the outer flap is assisted both when opening and closing the latter. This is caused by one "attachment point" of this gas spring moving along the slot 26 and the other attachment point moving along slot 27. A dirt scraper is denoted by 39.

The weighing system described above makes it possible to weigh the bag 23 of domestic refuse resting on the inner flap 11 in the position in accordance with Fig. 2 and to store this weight in the memory of control system 37. If appropriate, balancing weights may be present in inner flap 11, in order to eliminate effects produced by the weight thereof.

The structure described above can be sealed in a particularly successful manner, so that gases emanating from the store are as far as possible prevented from passing out into the atmosphere. Moreover, controlled ventilation is possible. It is also possible to provide wiper means in order to clean the inner and/or outer flaps during each opening and/or closing operation.

It will be clear from the above that a particularly expedient device for feeding in objects in an individualized manner is achieved by particularly simple means. It will be understood by the person skilled in the art that numerous modifications may be made which are obvious to the person skilled in the art on reading the above text and which lie within the scope of the appended claims.

Claims

1. Device (6) for the individualized introduction of objects, such as household refuse, comprising an introduction opening (8) which can be closed off by a drum-shaped outer flap (10), a drum-shaped inner flap (9) which interacts with the drum-shaped outer flap and is able to open a discharge opening (9) to a store (4), such as a household-refuse store, the interaction between outer flap and inner flap being such that when the introduction opening (8) is open the inner flap (11) closes off the discharge opening, in order in this way to define a limited introduction volume, characterized in that the inner flap and outer flap can be coupled to one another in such a manner that during the first part of the opening travel the inner flap is connected to the outer flap in the sense of closing off the introduction opening by the inner flap, in that during the second part of the opening travel the inner flap is uncoupled from the outer flap and moves in the sense of opening the introduction opening, and in that during closure of the outer flap the latter is coupled to the inner flap.

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2. Device according to Claim 1, in which the discharge opening (9) is opened during the first part of the opening travel.

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3. Device according to one of the preceding claims, in which a lock (28) is arranged between the inner flap and outer flap.

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4. Device according to one of the preceding claims, in which the inner flap and outer flap are arranged so as to rotate about the same axis.

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5. Device according to one of the preceding claims, comprising a housing, the inner flap being mounted in the housing in such a manner that it is essentially enclosed in the horizontal direction and is mobile to a limited extent in the vertical direction.

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6. Device according to Claim 5, in which the mobility in the vertical direction is at least 10 mm.

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7. Device according to Claim 5 or 6, in which the bearing comprises an axle stud (19) which is supported on a weighing element (22).

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8. Device according to one of the preceding claims, in which the inner flap and outer flap have the same diameter.

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9. Device according to one of the preceding claims, in which means (25) which assist the rotary movement of at least one of the said flaps are present.

Fig - 1

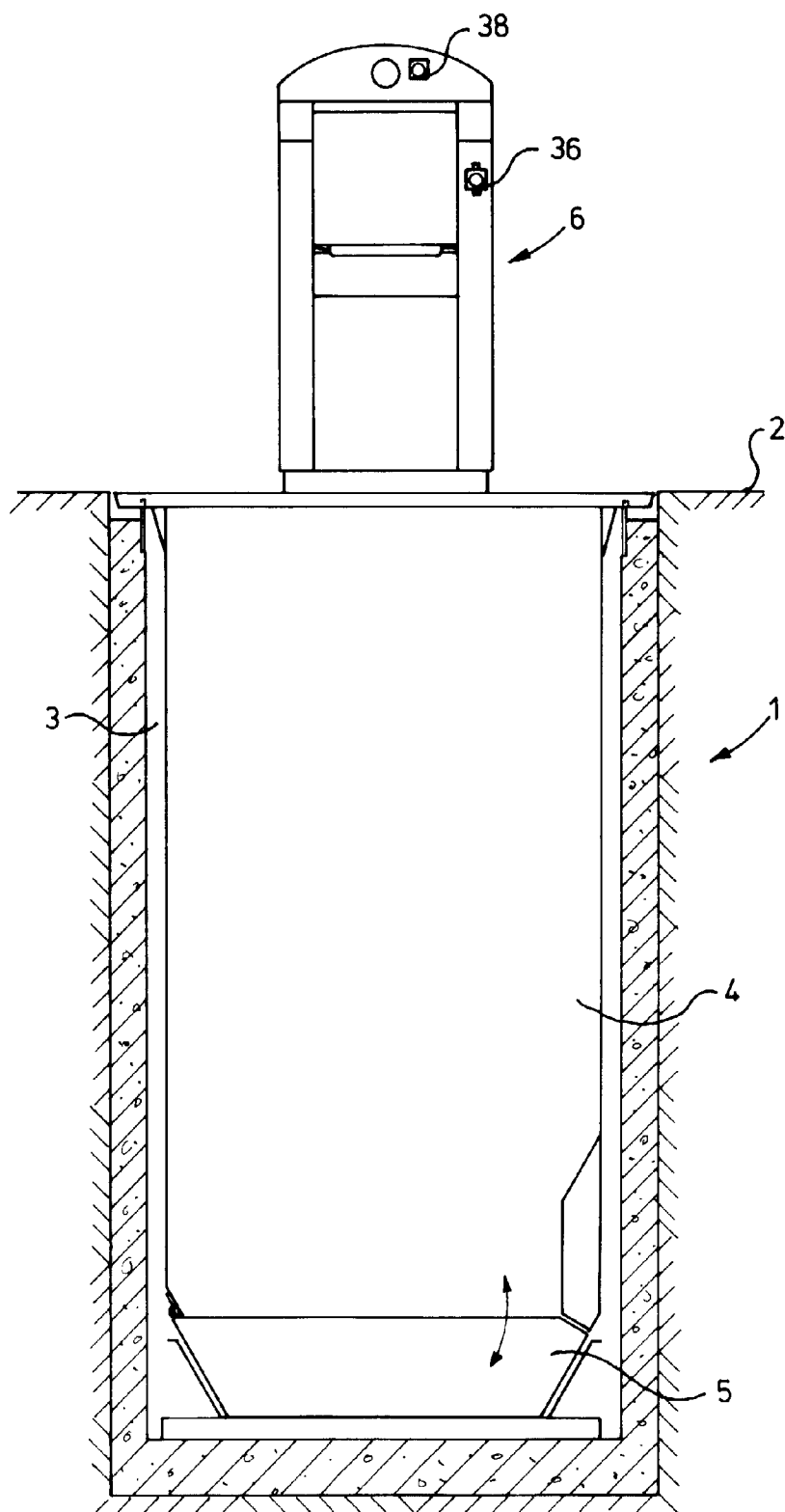
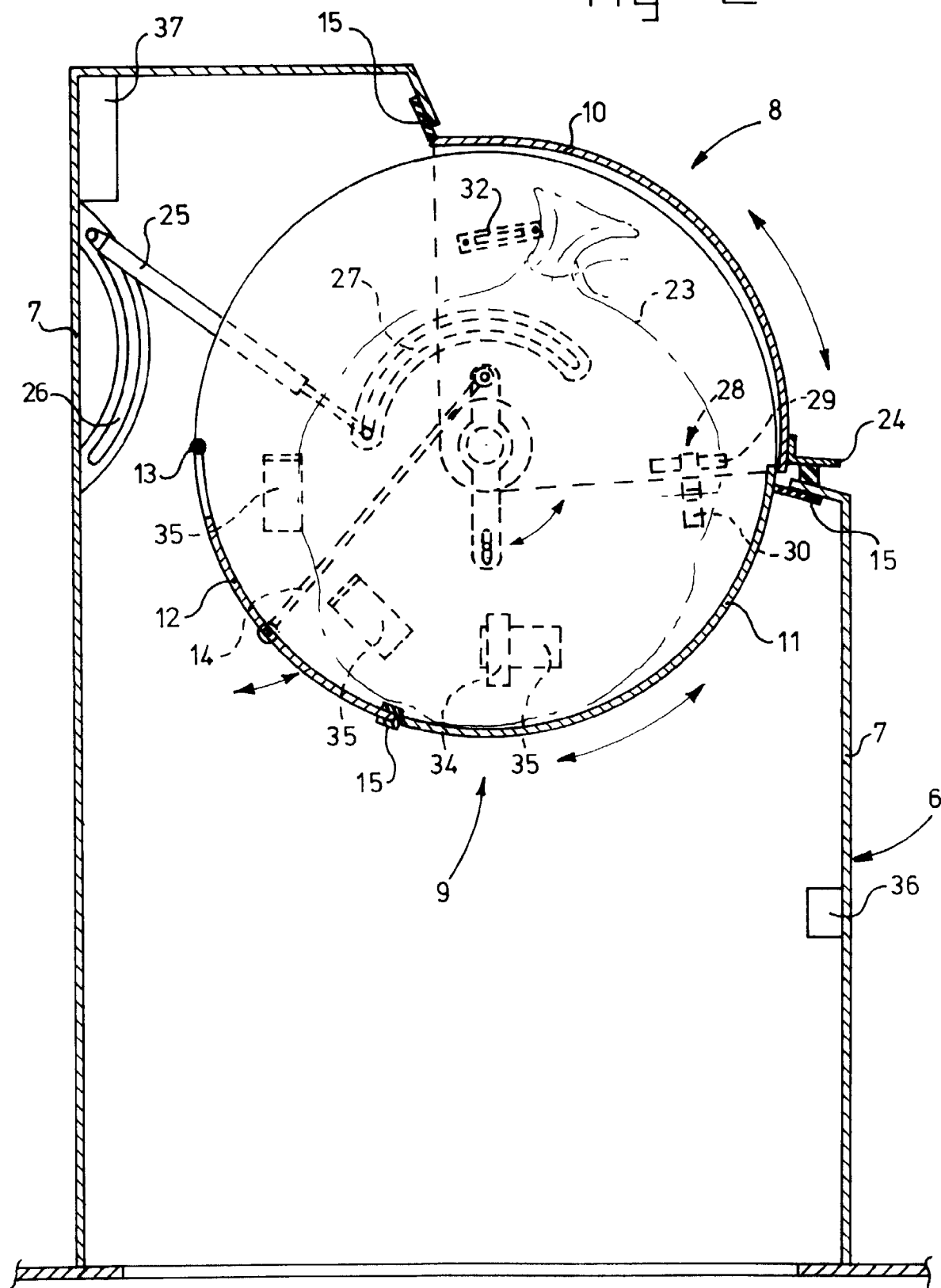


fig - 2



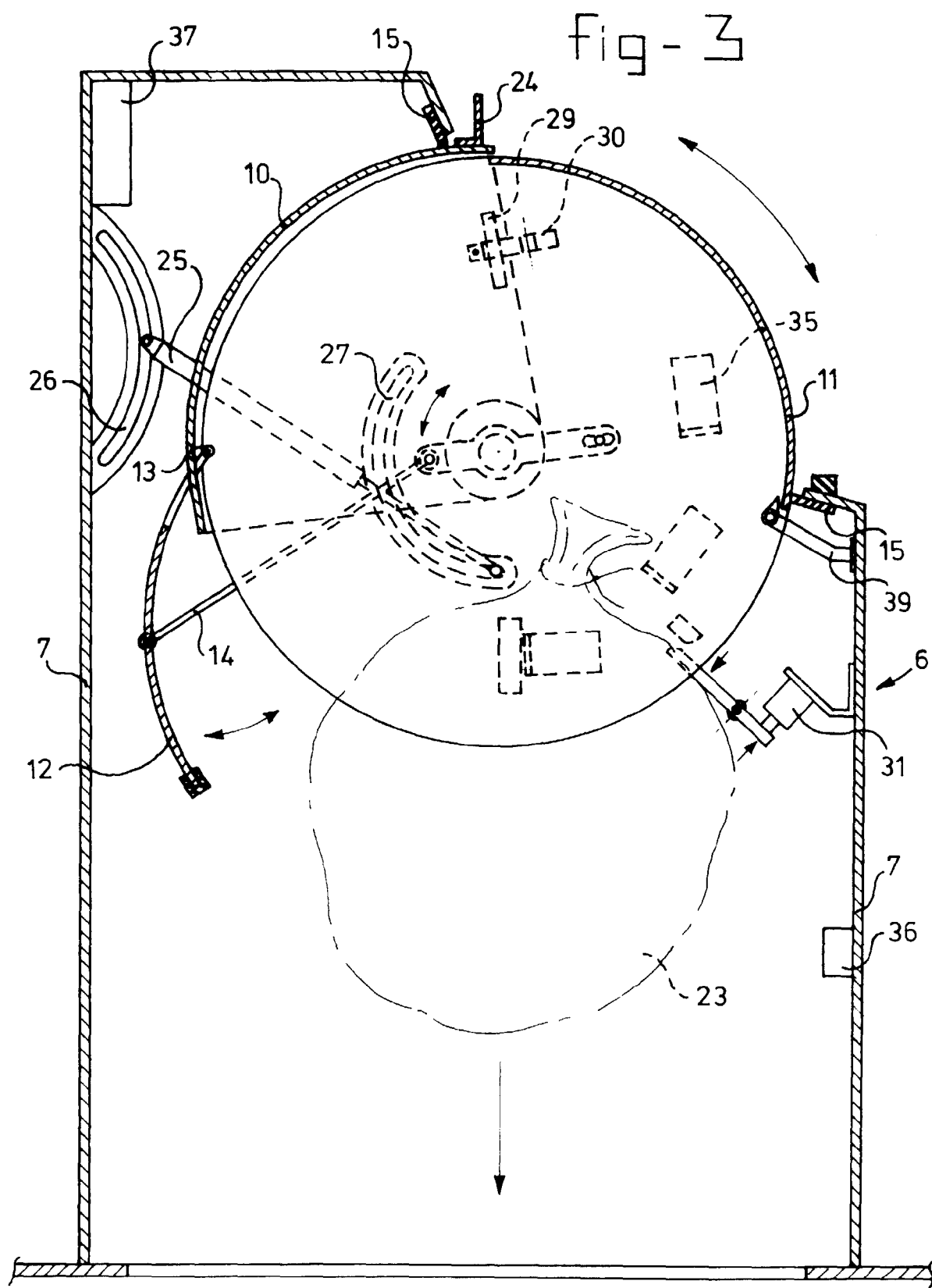


fig - 4

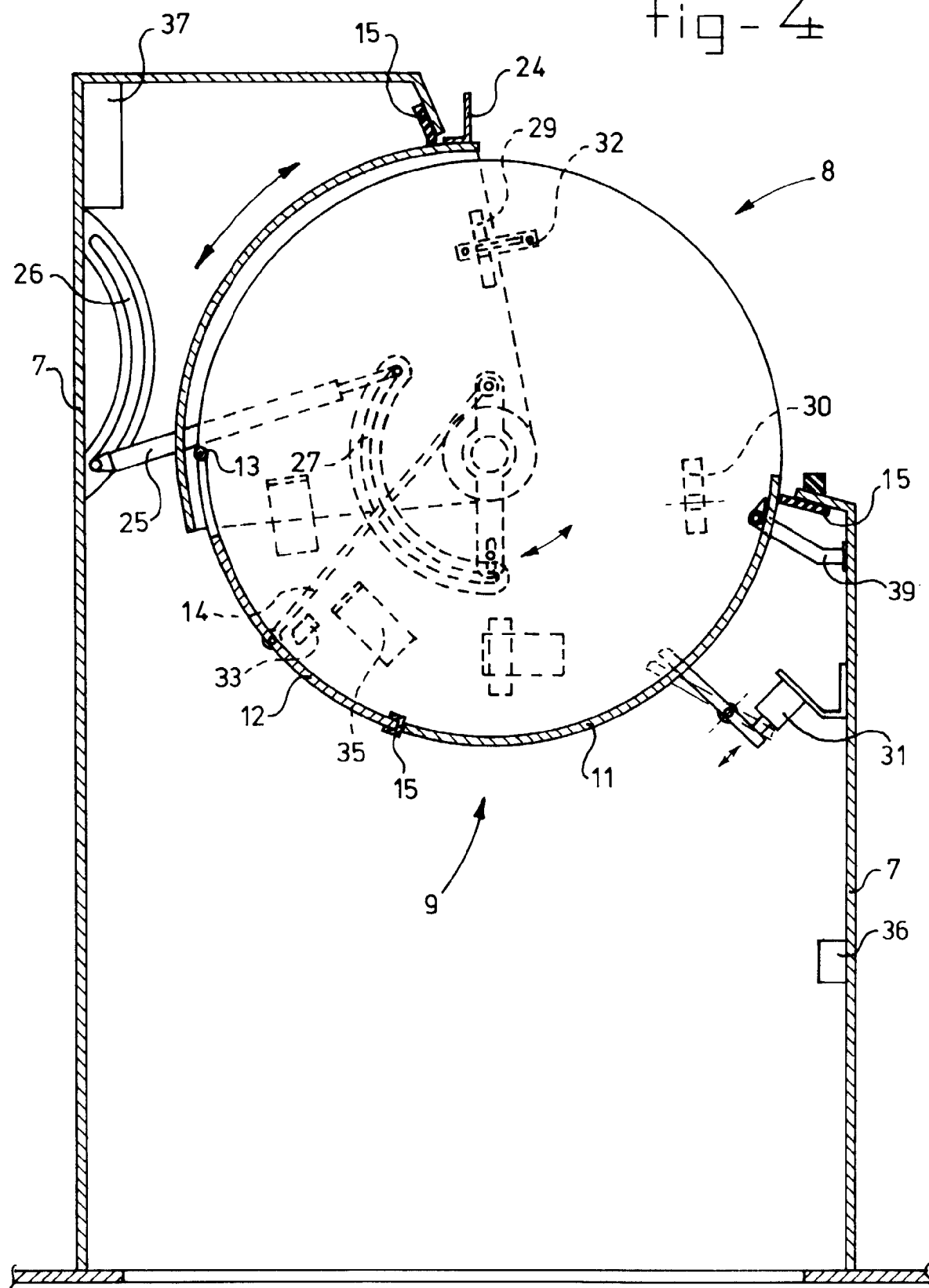
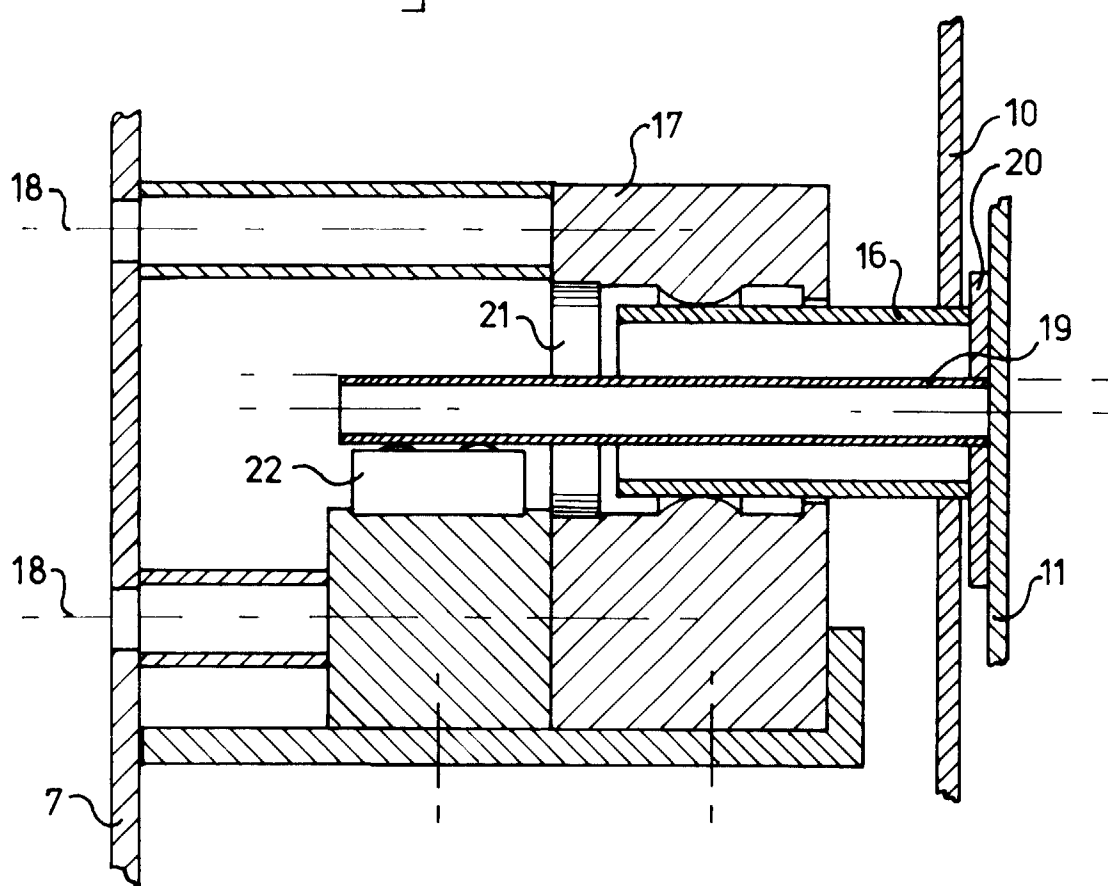


fig - 5





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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 2485

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)
A	DE 296 07 779 U (FRITHJOF W. SCHEPKE GMBH) 8 August 1996 * page 5, line 9 - page 6, line 12 * * page 7, line 9 - line 39 * * page 10, line 17 - page 12, line 2 * * figures 1-6 * ---	1,4	B65F1/10 B65F1/14
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A	DE 94 07 814 U (RHEINWERK ENTSORGUNGSPRODUKTE GMBH & CO KG) 14 September 1995 * page 5, line 1 - page 7, line 16; figures 1-4 * ---	1,4	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 September 1998	Examiner Smolders, R
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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