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(54) Equipment for collecting fluid fatty household waste

Einrichtung zum Sammeln von fließfähigem, fettigem Hausmüll

Équipement de collecte de déchets ménagers fluides gras

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Description

[0001] The present invention relates to equipment for collecting fluid fatty household waste according to the preamble of claim 1.

[0002] EP-A-0102126 discloses such an equipment for collecting waste motor oil, having a housing with at least one holder for the oil and accessible via a first opening in the housing and a collecting space for the oil containers accessible via a second opening in the housing. By providing in one housing at least one holder for the waste fluid and separate therefrom a separately accessible space for the containers the waste oil can be disposed off quite easily: the container (oil can, bottle) is first emptied into the opening that is meant for that purpose and thereafter the container is deposited in the collecting space.

[0003] This known collecting reservoir comprises an openable enclosure formed to receive a collection tank, a support supporting the collection tank in the enclosure, wherein the enclosure is closed by a top from above, and an aperture is formed in the top. This aperture is closed by an cover openable by lifting. A funnel tapering downwards is situated at the aperture.

[0004] Though this reservoir is well suited for collecting waste motor oil it is cumbersome to use it for collecting fatty household waste.

[0005] Fatty household waste pollutes the environment and also contains a substantial amount of utilisable energy. The disposal of such waste to household waste or the common sewer network significantly pollutes the environment. The selective collection and recycling of such household fat or oil waste would be expedient. There is no equipment known for such purpose, be means of which fatty waste generated in households could be collected. For the purposes of the present description, fluid fatty household waste includes edible oils, frying oils and other fats that can be emptied from vessels by way of gravitation.

[0006] An object to be achieved is to provide an equipment suitable for the selective collection of fluid fatty household waste, which can be placed in residential areas, the staircases of block of flats or other places suitable for this purpose, respectively. Within the framework of the same object, it is aimed to develop the equipment in a manner that enables the collection of such collected fat, oil from the equipment, respectively.

[0007] A further object is that the oil and oily fat collected in the equipment can be stored safely before its removal and that any unpleasant smells generated during its storage can be retained.

[0008] In order to achieve the aimed objective, we have designed an equipment for the collection of fluid fatty household waste having the substantial features specified in Claim 1.

[0009] Preferred embodiments of the equipment according to the invention are defined by the features of the dependent claims

[0010] The invention will be disclosed in details with reference to the attached drawings showing exemplary embodiments of the invention. In the drawings

5 Figure 1 is the schematic sectional view of the equipment according to the invention,
Figure 2 is the schematic sectional view of a funnel connected to a top of the equipment,
10 Figure 3 is a drawing showing the co-operation of a sliding cover closing an aperture on the top of an enclosure of the equipment with a valve at the bottom of the funnel at the time when the valve is just starting to close,
15 Figure 4 is a drawing corresponding Figure 3 but with a the cover completely moved aside and the valve completely closed.

[0011] The embodiment of the equipment according to the invention shown on Figure 1 has an enclosure 10, which has an opening door not separately shown, through which a collection tank 20 may be placed into the enclosure 10. The enclosure 10 has a strong frame structure, and is mounted with a suitable safety locking structure preventing unauthorised access to the interior of the enclosure 10. The material of the enclosure 10 and the frame structure thereof, depending on the selected manufacturing method, may be made of metal, metal alloy, plastic or any other material that complies with the relevant safety and environment protection requirements. Its shape may be an essentially rectangle or square-base prism or even a circular cylinder

[0012] In the enclosure 10, there is a support 16 arranged, the height of which is expediently adjustable, whereon the collection tank 20 may be placed. The collection tank 20 is for the safe storing and removal of the fluid household fat to be collected, and accordingly, it complies with the relevant safety and environment protection requirements. It may be made of both plastic and metal. It is expedient to use tanks normally applied for such purpose, mounted with a snapping lid and a handhold for its moving by human force. Of course, the collection tank 20 may have a different shape, with such outer dimensions and capacity that are sufficient for the receiving the fat 22 to be prospectively collected by the equipment.

[0013] When the collection tank 20 is put in, its lid must be removed, and it must be placed on the support 16 with the lid removed. Within the enclosure 10, there is a lid 24 having a similar shape, which is, however, fixed and may be removed from the enclosure 10 only by appropriate dismounting operations. Such removal is not necessary when the collection tank 20 is changed after it has filled. The function of the lid 24 shall be specified in more detail later below.

55 **[0014]** On its upper side the enclosure 10 is closed by a top 12, which has an aperture 14 arranged approximately in its middle. From the aperture 14, a funnel 50 for receiving the fat reaches downwards towards the col-

lection tank 20. The funnel 50 tapers downwards and a valve 60 is attached to its lower edge; while below the valve 60 an aperture 26 is formed on the lid 24 which is adapted to let the fat 22 flow through down from the funnel 50. The part of the funnel 50 falling outside the aperture 26 is connected to the lid 24 by an elastic bellow 56 shaped with corrugated walls.

[0015] The valve 60 attached to the funnel 50 has a valve disc 62, which is arranged slideably along the rod 65. A washer 61 is affixed to the lower end of the rod 65, for example by means of a nut screwed onto a thread cut on the rod 65 or any other suitable fixing element. There is a spring 64 between the washer 61 and the valve disc 62. The rod 65 is located along the axis of the funnel 50, and its central position is determined by holding elements 52 and 54, which fit into the inside of the funnel 50 and have sleeves 53, 55 in their centre as shown in Figure 3, and hold the rod 65 in such a manner that it remains moveable upwards and downwards. At least the upper one of the holding elements 52 and 54 is a filter.

[0016] In case of the present embodiment, the aperture 14 formed on the top 12 is closed by a cover 70, which can be slid sideways along guide rails 76. The cover 70 and the valve 60 cooperate with one another so that only one of them is open at the same time. The cover 70 operates the valve 60 in such a manner that when the cover 70 is slid to open position, the valve 60 closes. To this end, an arm 66 is joined pivoting to the upper end of the rod 65 of the valve 60, and it is passed through the guiding sleeve 67 located at the edge of the funnel 50. The guiding sleeve 67 can be pivoted around the hinge 68. In case the upper holding element 52 is formed as a filter, the clear mesh of the filter is determined in such a manner that the particles getting through the filter do not hinder closure of the valve 60. The second end of the arm 66 co-operates with a sliding cam 72 formed at the underside of the cover 70 in such a manner that sliding said cover 70 from the position closing the aperture 14 turns the arm 66 so that the first end of the arm 66 moves the rod 65 of the valve 60 upwards for closing of the valve 60.

[0017] There is a bellow 56 between the lid 24 and the outer surface of the funnel 50, which bellow 56 prevents fat flowing down from the funnel 50 from getting to unwanted places within the enclosure 10. Should the collected fat escape despite of the above due to a leakage, it will be collected by a tray placed in the bottom of the enclosure 10, which tray may also be emptied when the collection tank 20 is changed.

[0018] There is a transmitter 30 in the interior of the enclosure 10, which transmitter 30 is connected to a level sensor 32 detecting the level of the fat 22 in the collection tank 20. In case of the embodiment shown, the level sensor 32 is shaped as a float, and the transmitter 30 forwards the information relating to the amount of the fat 22 collected to a central supervising unit not shown. As level sensor also a scale can be used that detects the weight of the fluid household fat 22 in the collection tank 20.

[0019] Expediently, the transmitter 30 transmits the

signs via a mobile phone network. Furthermore, the transmitter 30 may forward other information as well to the supervising unit. Such information can be for example:

- the level of the fat 22 in the collection tank 20,
- the time when the enclosure 10 is opened,
- loss of energy supply or low energy supply,
- error signal,
- temperature signal or fire alarm,
- smoke alarm, etc.

[0020] The function of the equipment according to the invention is described with reference to Figs. 1 to 4.

[0021] The equipment placed in residential areas, housing estates, staircases or highly populated residential settlements, public buildings or near selective waste collection facilities can be used for the collection of waste fat deriving from households in such a manner that the cover 70 on the top 12 of the enclosure 10 is slid to the right as shown in Figures 3 and 4, as a result of which the upper aperture of the funnel 50 becomes free and the valve 60 at its bottom is closed. The waste fat is poured into the funnel 50 from a bottle or some kind of vessel, and when the pouring is finished, the cover 70 is pushed back over the aperture 14. This is when the valve 60 opens and the fat runs down through the open valve 60 and the aperture 26 on the lid 24 to the collection tank 20. The capacity of the collection tank 20 is selected so that it would fill up around at the same time as the collection tank 20 of another equipment collecting similar fat fill up, so that they can be emptied on the same day. Emptying and removal is a costly operation, especially if the relatively low value of the fat collected is considered.

[0022] The level of the fat 22 in the collection tank 20 is detected by the level sensor 32 and the transmitter 30 forwards data on the detected level to the supervising centre with a certain regularity. Considering that it is not very likely that the collection tank 20 will fill up quickly, the interval between the information transmissions may be relatively long, for instance 2 hours, or even 6-8 hours. In addition to regular data transmissions, extraordinary data transmissions may become necessary, for instance when the collection tank 20 is filled unexpectedly quickly, e.g. after holidays, when the amount of waste fat deriving from households exceeds the usual amount. Extraordinary transmissions will be necessary when the door of the enclosure 10 is opened, or in case of an error or fire, etc.

[0023] When the level of the fat 22 in the collection tank 20 reaches a preset value, the supervising centre gives an instruction to change the collection tank 20. Upon changing, the operating person, having opened the door of the enclosure 10, takes the lid 24 off the collection tank 20, lifts the full collection tank 20 out of the enclosure 10 by means of a barrow adapted for this purpose, and places an empty collection tank 20 in place of the full collection tank 20. Then the full collection tank 20 is covered by a

lid and placed in a transport vehicle. In connection with the foregoing, it is to be noted that no special transport vehicles are needed for transporting the collection tanks 20.

[0024] Furthermore, a locking rod 44 is lead through the lid 24 and a float 42 is arranged at the lower end of the locking rod 44 while the upper end of the locking rod 44 forms a latch 40, which protrudes above the level of the top 12 when the float 42 raises and prevents the cover 70 from being slid aside. Such kind of locking the equipment should be avoided because it has a highly unfavourable psychological effect on the persons for bringing fat to the equipment in vain.

[0025] Figure 2 shows the structure of the funnel 50 without the parts of the valve 60. An upper holding element 52 and a lower holding element 54 is located in the funnel 50. Both of them has a sleeve 53, 55. The upper holding element 52 is formed as a filter, and thereby it prevents any coarse solid waste included in the fat 22 poured down from getting into the valve 60 and blocking the valve disc 62 from closing on the valve 60, thereby blocking the valve 60 from being closed. Of course, a small amount of leakage may be allowed, it does not influence the operation of the equipment according to the invention. The lower holding element 54 does not need to be a filter, it is sufficient if it holds the sleeve 55 centrally in the centre-line of the funnel 50. To allow cleaning of the equipment both holding elements 52 and 54 may be lifted out from above from the funnel 50. In an assembled status their removal is not possible, only a person authorised to do so can lift it out together with other moving parts of the valve 60 in case the cover 70 is slid to a maintenance position, which is different from the normal operating position. In order to prevent any unauthorised persons from being able to move the cover 70 into such mounting position, there is also such a lock (not shown) on the top 12 which may be operated only from the inside of the enclosure 10. Such lock is not unavoidably necessary if the arm 66 operating the valve 60 is formed in such a way that it prevents the cover 70 from being moved into the mounting position, except if after the enclosure 10 is opened, the rod 65 of the valve 60 is pushed upwards by hand, resulting in the arm 66 overlying onto the upper surface of the top 12 and may give free way to sliding the cover 70 as much as wanted.

[0026] Figure 1 shows the cover 70 in a closed position, when the valve disc 62 and the rod 65 move downwards by their own weight. Figure 3 shows the cover 70 in a position slid slightly to the right towards the direction of the arrow 75, wherein it just begins to turn the arm 66, which lifts the rod 65 upwards along arrow 69 together with the valve disc 62 on the rod 65. When arm 66 is being turned, at the same time it slides in the guiding sleeve 67. Figure 4 shows the cover 70 in a completely open position, when the arm 66 is turned almost to a horizontal position and it lifts the rod 65 up completely. In such case, the valve disc 62 is pushed against the lower edge of the funnel 50, while the spring 64 is com-

pressed and presses the valve disc 62 on the edge of the funnel 50.

5 Claims

1. Equipment for collecting fluid fatty household waste (22), comprising an openable enclosure (10) formed to receive a collection tank (20), a support (16) in the enclosure (10) for supporting the collection tank (20), a top (12) closing the enclosure (10) from above, the top (12) having an aperture (14) closed by an openable cover (70) and a funnel (50) tapering downwards from the aperture (14) **characterised in that** the cover (70) closing the aperture (14) is opened by sliding it sideways, that below the funnel (50) there is a lid (24) closing the collection tank (20) in an openable manner and having in its centre an aperture (26) to let through the fluid fatty household waste (22), whereby the outer surface of the funnel (50) is connected to the lid (24) by an elastic bellows (56) shaped with corrugated walls, that a valve (60) is connected to lower edge of the funnel (50), the valve (60) having a valve disc (62), pressing against the lower edge of the funnel (50) in a sealed manner, whereby the valve disc (62) is arranged on a rod (65) in a sliding manner, the rod (65) having a washer (61) affixed to its bottom end and a spring (64) arranged between the washer 61 and the valve disc (62), that the funnel (50) further comprises upper and lower holding elements (52,54) arranged above one another inside the funnel (50) and having sleeves (53,55) in their centre to guide the rod (65) in a sliding manner along the central axis of the funnel (50), and a guiding sleeve (67) arranged at the upper edge of the funnel (50) and pivotable around a hinge (68), whereby the upper end of the rod (65) is pivotable joined to a first end of an arm (66) which is slidably guided in the guiding sleeve (67), the other second end of the arm (66) cooperating with a sliding cam (72) formed at the underside of the cover (70) such that sliding the cover (70) from the position closing the aperture (14) turns the arm (66) so that the first end of the arm (66) moves the rod (65) with the valve (60) upwards for closing the lower edge of the funnel (50), and that the enclosure (10) further comprises a transmitter (30) connected to a level sensor (32) detecting the level of the fluid fatty household waste (22) in the collection tank (20).

2. The equipment according to claim 1 **characterised in that** there is a locking rod (44) passing through the lid (24), and there is a float (42) operated by the level of the fluid fatty household waste (22) connected to the end of such locking rod (44), the upper end of which is passing through the top (12) of the enclosure (10) in a moveable manner, and such upper end constitutes a latch (40) preventing the opening of the

cover (70) if the level of the fluid fatty household waste (22) in the collection tank (20) exceeds a previously specified level.

3. The equipment according to claim 1 or 2 **characterised in that** the transmitter (30) is in a telecommunication connection with a mobile telephone network. 5
4. The equipment according to any of the claims 1 to 3 **characterised in that** the level sensor (32) is a scale detecting the weight of the fluid fatty household waste (22) in the collection tank (20). 10
5. The equipment according to any of the claims 1, 3 and 4 **characterised in that** there is a latch (40) on the top (12) of the enclosure (10), which latch (40) prevents the opening of the cover (70) if the level of the fluid fatty household waste (22) in the collection tank (20) exceeds a previously specified level, and the latch (40) is in an operating connection with the transmitter (30). 15 20
6. The equipment according to any of the preceding claims **characterised in that** at least the upper holding element (52) is shaped as a filter. 25
7. The equipment according to any of the preceding claims **characterised in that** the transmitter (30) is adapted to transmit additional information, optionally representing intrusion, error, temperature, fire emergency. 30

Patentansprüche

1. Gerät zum Sammeln von Altspeiseölen und -Fetten aus Haushalten (22), das Gerät enthält ein geöffnetes Gehäuse (10), das zur Aufnahme eines Sammelbehälters (20) ausgebildet ist, einen Halter (16) in dem Gehäuse (10) zum Halten des Sammelbehälters (20), eine Oberseite (12), die das Gehäuse (10) von oben abschließt, die Oberseite (12) enthält eine Öffnung (14), die durch eine aufschließbare Abdeckung (70) bedeckt ist, und einen von der Öffnung (14) sich nach unten verjüngenden Trichter (50), **dadurch gekennzeichnet, dass** die die Öffnung (14) deckende Abdeckung (70) durch ihre seitliche Verschiebung geöffnet wird, ein Deckel (24) unter dem Trichter (50) angeordnet ist, der den Sammelbehälter (20) in wiederaufschließbarer Weise abdeckt und eine Öffnung (26) im Mittelpunkt des Sammelbehälters (20) aufweist, um Altspeiseölen und -Fetten von Haushalten (22) durchzulassen, wobei die äußere Oberfläche des Trichters (50) über einen elastischen Federbalg (56) mit gewellten Wänden mit dem Deckel (24) verbunden ist, ferner dass ein Ventil (60) dem unteren Rand des Trichters (50) angeschlossen 50

ist, das Ventil (60) verfügt über einen Ventilteller (62), der dem unteren Rand des Trichters (50) abdichtend gepresst ist, wobei der Ventilteller (62) an einem Stab (65) in gleitender Weise angeordnet ist, der Stab (65) enthält eine Unterlegscheibe (61) an seinem unteren Ende befestigt und eine Feder (64), die zwischen der Unterlegscheibe (61) und dem Ventilteller (62) angeordnet ist, ferner dass der Trichter (50) obere und untere Halteelemente (52, 54) enthält, die im Inneren des Trichters (50) übereinander angeordnet sind und in ihrem Mittelteil je eine Buchse (53, 55) für die gleitende Führung des Stabes (65) entlang der Mittelachse des Trichters (50), und eine Führungsbuchse (67) aufweisen, die am oberen Rand des Trichters (50) um ein Gelenk (68) schwenkbar angeordnet ist, wobei das obere Ende des Stabes (65) einem ersten Ende eines Armes (66) schwenkbar angeschlossen ist, der gleitend in der Führungsbuchse (67) geführt ist, und das andere zweite Ende des Armes (66) mit einer gleitenden Nocke (72) zusammenwirkt, die auf der unteren Seite der Abdeckung (70) derart ausgebildet ist, dass durch Verschieben der Abdeckung (70) von ihrer die Öffnung (14) abschließenden Position der Arm (66) derart verdreht wird, dass das erste Ende des Armes (66) den Stab (65) mit dem Ventil (60) nach oben bewegt, um den unteren Rand des Trichters (50) abzusperren, und dass das Gehäuse (10) ferner einen Sender (30) enthält, der einem Niveausensor (32) angeschlossen ist, der den Pegel der Altspeiseölen und -Fetten aus Haushalten (22) im Sammelbehälter (20) detektiert.

2. Das Gerät nach Anspruch 1 **gekennzeichnet durch** einen sich **durch** den Deckel (24) erstreckenden Riegelbolzen (44), und es gibt einen Schwimmer (42), der **durch** den Pegel der Altspeiseölen und -Fetten aus Haushalten (22) betätigt wird und mit dem Ende des Riegelbolzens (44) verbunden ist, dessen oberes Ende sich **durch** die Oberseite des Gehäuses (10) bewegbar erstreckt, und dieses obere Ende einen Riegel (40) bildet um das Öffnen der Abdeckung (70) zu verhindern, wenn der Pegel der Altspeiseölen und -Fetten aus Haushalten (22) in dem Sammelbehälter (20) einen vorher festgelegten Pegel übersteigt. 35 40
3. Das Gerät nach Anspruch 1 oder 2 **dadurch gekennzeichnet, dass** der Sender (30) in einer Telekommunikationsverbindung mit einem Mobiltelefonnetz steht. 45
4. Das Gerät nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet daß** der Niveausensor (32) durch eine Waage gebildet ist, die das Gewicht der Altspeiseölen und -Fetten aus Haushalten (22) in dem Sammelbehälter (20) detektiert. 55

5. Das Gerät nach einem der Ansprüche 1, 3 und 4 **dadurch gekennzeichnet, daß** ein Riegel (40) auf der Oberseite (12) des Gehäuses (10) angeordnet ist, der Riegel (40) verhindert das Öffnen des Deckels (70), wenn der Pegel der Altspeiseölen und -Fetten aus Haushalten (22) in dem Sammelbehälter (20) einen vorher festgelegten Pegel übersteigt, und der Riegel (40) steht in Wirkverbindung mit dem Sender (30).
6. Das Gerät nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** zumindest das obere Halteelement (52) wie ein Filter ausgeformt ist.
7. Das Gerät nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, daß** der Sender (30) geeignet ist, um weitere Informationen zu senden, die gegebenenfalls Eindringen, Fehler, Temperatur, Feueralarm vertreten.

Revendications

1. Un équipement pour la collecte de déchets ménagers liquides graisseux (22), l'équipement comprenant un boîtier (10) ouvert qui est adapté pour recevoir un réservoir collecteur (20); un support (16) dans le boîtier (10) pour supporter le réservoir collecteur (20); une partie supérieure (12) qui ferme le boîtier (10) d'en haut; la partie supérieure (12) comprenant une ouverture (14) fermée recouverte par un couvercle (70) ouvrable et la partie supérieure (12) de l'équipement comprenant une trémie (50) en forme de tronc de cône vers le bas à partir de l'ouverture (14), **caractérisé en ce que** le couvercle (70) fermant l'ouverture (14) s'ouvre par glissement latéral, un couvercle (24) est disposé sous la trémie (50) de manière reouvrable, le couvercle (24) présente une ouverture (26) au centre de la réservoir collecteur (20) pour le passage de déchets ménagers liquides graisseux (22), la surface extérieure de la trémie (50) est reliée à la couvercle (24) par l'intermédiaire d'un soufflet élastique (56) à parois ondulées, une soupape (60) est reliée au bord inférieur de la trémie (50), la soupape (60) comprends un disque de soupape (62) appliqué contre le bas de la trémie (50) de manière étanche, le disque de soupape (62) est disposé sur une tige (65) de manière coulissante, la tige (65) comprend une rondelle (61) qui est fixé à son extrémité inférieure, et un ressort (64) qui est disposé entre la rondelle (61) et le disque de soupape (62), la trémie (50) comprend en outre des éléments de retenue (52, 54) supérieur et inférieur qui sont disposés à l'intérieur de la trémie (50) l'un au-dessus de l'autre, les éléments de retenue (52, 54) comprennent chacun dans leur partie centrale une douille (53, 55) pour le guidage coulissant de la tige (65) le long de l'axe central de la trémie (50), et une douille de guidage (67) disposée sur le bord supérieur de la trémie (50) pivoter autour d'une charnière (68), l'extrémité supérieure de la tige (65) est reliée à une première extrémité d'un bras (66) de façon pivotante, celui-ci étant guidé de manière coulissante dans la douille de guidage (67), et la seconde extrémité du bras (66) coopère avec une came (72) coulissante formée sur le côté inférieur du couvercle (70) de telle manière qu'en glissant le couvercle (70) de sa position fermant l'ouverture (14), le bras (66) est tourné de telle sorte que la première extrémité du bras (66) déplace la tige (65) avec la soupape (60) vers le haut pour fermer le bord inférieur de la trémie (50), et que le boîtier (10) comprend en outre un émetteur (30) qui est relié à un capteur de niveau (32) détectant le niveau des huiles de cuisson usagées et de graisses provenant de ménages (22) dans le réservoir collecteur (20).
2. L'équipement selon la revendication 1, **caractérisé par** un boulon de verrouillage (44) s'étendant à travers le couvercle (24), et il existe un flotteur (42) actionné par le niveau des déchets ménagers liquides graisseux (22), relié à l'extrémité du boulon de verrouillage (44) dont l'extrémité supérieure s'étend de façon mobile à travers la partie supérieure du boîtier (10), et cette extrémité supérieure forme un verrou (40) pour empêcher l'ouverture du couvercle (70) lorsque le niveau des déchets ménagers liquides graisseux (22) dans le réservoir collecteur (20) dépasse un niveau prédéterminé.
3. L'équipement selon la revendication 1 ou 2, **caractérisé en ce que** l'émetteur (30) se trouve dans une connexion de télécommunication avec un réseau de téléphonie mobile.
4. L'équipement selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** le capteur de niveau (32) est formé par une échelle qui détecte le poids des déchets ménagers liquides graisseux (22) dans le réservoir collecteur (20).
5. L'équipement selon l'une quelconque des revendications 1, 3 et 4, **caractérisé en ce qu'un** verrou (40) est disposé sur la partie supérieure (12) de boîtier (10), lequel verrou (40) empêche l'ouverture du couvercle (70) lorsque le niveau des déchets ménagers liquides graisseux (22) dans le réservoir collecteur (20) dépasse un niveau prédéterminé, et le verrou (40) est dans une liaison de fonctionnement avec l'émetteur (30).
6. L'équipement selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'au** moins l'élément de support supérieur (52) à la forme d'un filtre.

7. L'équipement selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'émetteur (30) est adapté pour transmettre des informations supplémentaires, représentant éventuellement intrusion, erreur, température, secours-incendie.

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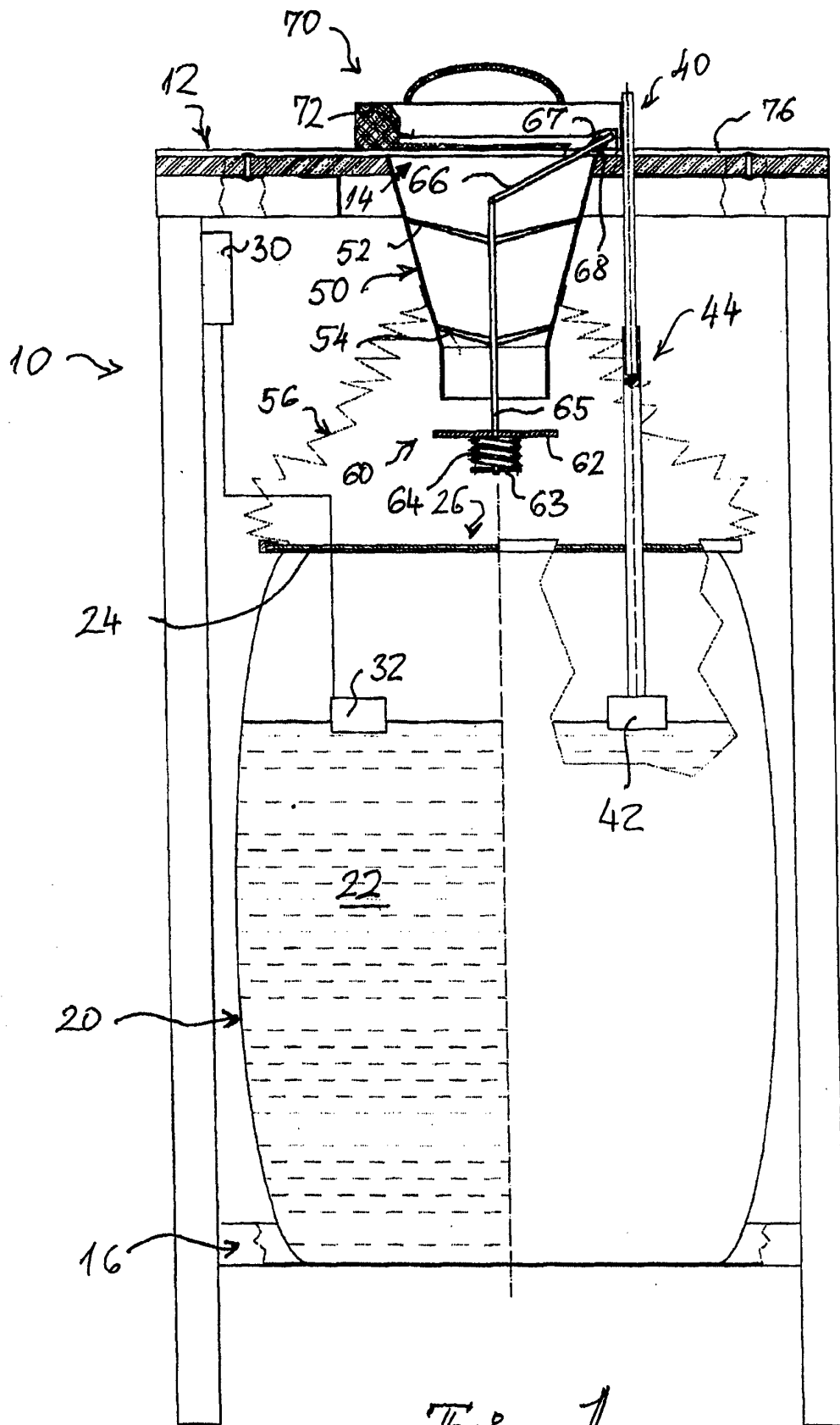


Fig. 1

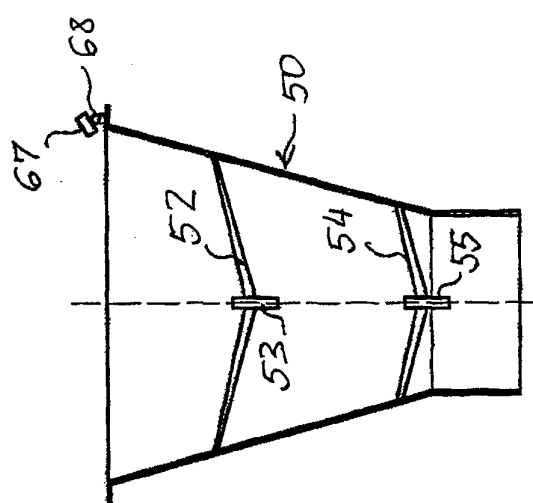


Fig. 2

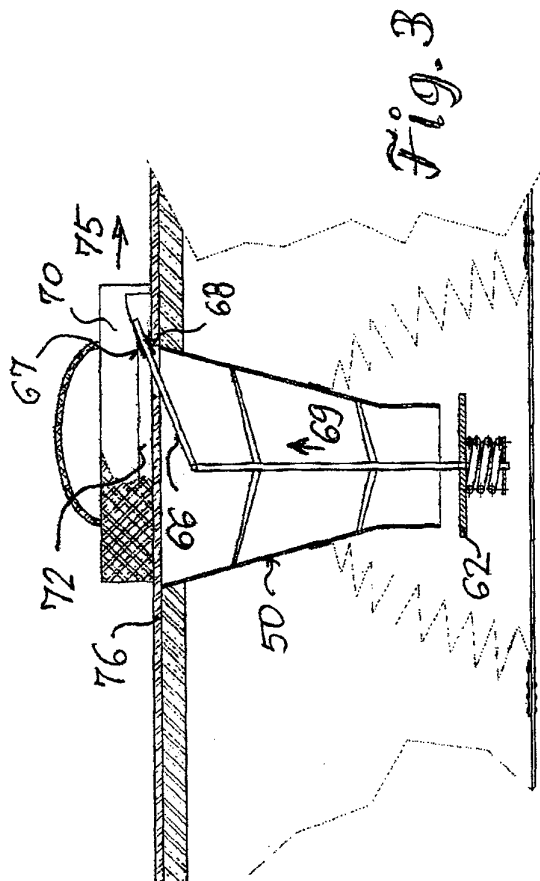


Fig. 3

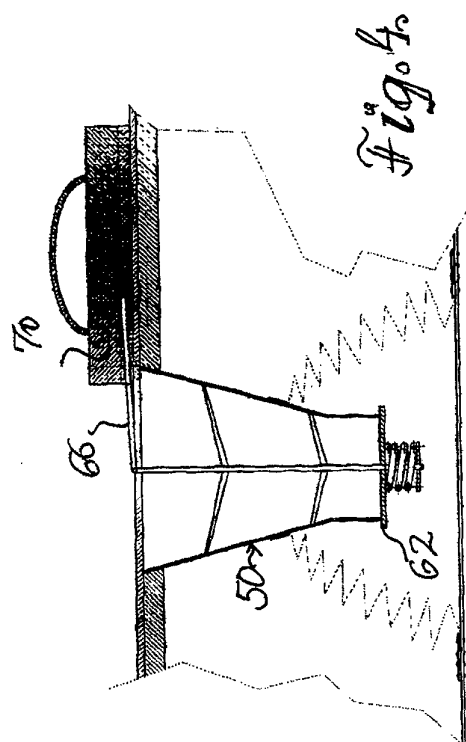


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0102126 A [0002]