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(54) **Assembly comprising a rubbish container and an envelope**

Vorrichtung, bestehend aus einem Müllbehälter und einer Umhüllung

Ensemble comprenant une poubelle et un enclos

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(73) Proprietor: **Bammens B.V.**
NL-3604 BA Maarssen (NL)

(72) Inventor:
Pruijser, Johan Sebastiaan
NL-2133 BL Hoofddorp (NL)

(74) Representative:
Land, Addick Adrianus Gosling et al
Arnold & Siedsma,
Advocaten en Octrooigemachtigden,
Sweelinckplein 1
2517 GK Den Haag (NL)

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Description

The present invention relates to an assembly according to the preamble of claim 1 where containers preferably for collecting rubbish are able to be emptied by means of one or more robot arms on a garbage truck.

Independently standing rubbish containers which are emptied by lifting them up by robot arms are known. These are mainly light, synthetic containers which are to be placed on the pavement by the user shortly before the garbage truck comes along. It goes without saying that the maximum capacity of the container is determined by the maximum lifting force of the robot arm.

Rust-resistant metal containers are also known. When such a container, of relatively low weight, for instance of about 100-150 kg (excluding contents) is placed on the street, it can be easily displaced, stolen, vandalized and/or tipped over by hooligans. Accordingly rubbish in the container would be spilt onto the street to cause an eye-sore as well as possible health hazards. In some cases a container made of rust-resistant metal is considered to be an eye-sore on its own. When such a metal container is damaged by vandals, this disagreeable sight is further increased.

In some areas, rubbish bags are still loaded into the garbage truck by hand. Hence the profession of garbage collector is still laborious and unhealthy.

European patent application 0 432 306 relates to a prior art assembly according to the preamble of claim 1 and comprising a poster-column container having an inner cylinder body for collecting old glass, used paper, used batteries and such waste.

The present invention provides an apparatus comprising:

- at least one container having at least one compartment for the collecting of rubbish provided with engaging means for engaging a robot arm and having a front wall, a rear wall, side walls, a bottom and an upper side;
- an envelope for the container, said envelope being securable to the ground;
- the container and the envelope being provided with cooperating means for guiding the container upwardly out of and downwardly in the envelope upon raising or lowering thereof and for keeping it in the correct position with respect to the envelope; the assembly being characterized in that the envelope is formed by a back wall and sidewalls with an open top and front side, the front wall of the container being provided with the robot arm engaging means, whereby a robot arm is able to engage said engaging means through the open front side of the envelope and to raise said container out of the envelope before tilting it.

One or more of the above mentioned problems is thus obviated, for instance the secureable envelope prevents the container from tilting, tipping over and/or being damaged. Furthermore since the robot arm is able to engage the container through the open front side of the envelope, the container is able to be mechanically lifted and subsequently tilted for emptying.

Further advantages, characteristics and details of the present invention will become clear with respect to the following description of a preferred embodiment thereof which refers to the accompanying diagrams which show:

Figure 1 a perspective view of an embodiment of the envelope according to the present invention for use with the embodiment of the assembly according to the present invention;
Figure 2 a perspective view of an embodiment of an embodiment of the assembly according to the present invention;
Figure 3 a partly broken away perspective view of the front side of the container of the assembly from figure 2;
Figure 4 a perspective view which furthermore shows how the container and the envelope of the assembly from figure 2 cooperate;
Figure 5 a perspective view of a second preferred embodiment of the envelope of the assembly according to the present invention; and
Figure 6 a perspective view of the second embodiment of the present invention wherein the container of the assembly is placed in the envelope of figure 6.

The embodiment of the envelope 1 as shown in figure 1, comprises a back wall 2 and two side walls 3, 4 whilst the front side 5, the upper side 6 and the lower side 7 are open.

Channels 8, 9 which are preferably mutually symmetrical, are mounted in the side walls 3, 4 respectively. The borders 10, 11 of the V-shaped grooves or channels 8 and 9 which are closest to the front side 5 of the envelope 1, each comprise three sections 12, 13, 14 and 15, 16, 17 respectively of increasing steepness with respect to the vertical.

The rear sides 20 and 21 of the channels 8, 9 respectively, downwardly narrow to the groove ends 18, 19 respectively. In the embodiment shown, the front edges 24, 25 of the side walls 3, 4 are shorter than the rear wall 2. The upper edges 22, 23 project upwardly from the front side to the rear wall. In the preferred embodiment shown, the envelope 1 is secured at a distance A from the ground by means of foot supports 30, 31, 32 and 33 respectively so that the ground beneath the envelope can be easily kept clean. The foot supports 30-33 are anchored to the ground by screw bolts.

To yield an attractive appearance, the envelope is preferably made from concrete with a washed grit layer thereon.

It is also possible to increase the attractiveness of the container in any other way or to use the container as an advertisement means.

In the preferred embodiment of the assembly 34 (figure 2) according to the present invention, the container 35 comprises four upstanding walls of which a front wall 36 and a side wall 37 as well as a bottom 38 and a lid 39 can be seen. In order to easily guide the container into the envelope, the bottom area is preferably somewhat smaller than the area taken up by the lid 39. Owing to this the containers are also stackable when the lids thereof are released. The lid is mostly provided with a coloured paint layer whilst the body of the container is not.

The bottom 38 is preferably situated near to the under edges of the walls 2, 3 and 4 of the envelope, wherein the container is suspended in the envelope.

A lid 39 is hingeably mounted on the container 35. This lid serves for the opening and closing respectively of the complete upper side of the container during the emptying thereof. Furthermore two second lids 40, 41 are mounted in the lid 39 of the shown embodiment. These serve, for example, for the opening and closing respectively of the rubbish deposit openings of the different compartments in the container. A contour part 42 is mounted onto the side walls of the container, this contour part being provided on the front side with recesses 44 and 45 for engaging a robot arm. The front side 43 of the contour part 42 has a larger dimension than the rear side, whilst the sides narrow from the front towards the rear.

Two projections 46, 47 are mounted onto the container 35, these projections 46, 47 preferably having a rectangular form and which extend downwardly from the upper side of the container side walls.

In the rest position, as shown in figure 2, the container 35 is supported by the grooves or channels 18, 19 via the projections 46, 47. The container hangs as it were in the envelope and preferably leans against the rear wall of the envelope 2 in order to ensure stability.

The front side 43 of the contour part 42 (figure 3) is, apart from the engaging means, preferably provided with locking means. These locking means comprise for example two pick-up units 50, 51 each for picking up of (a part of) a robot arm, said pick-up units each comprising a spring 52, 53 respectively, a side wall 54, 55 respectively and a contra-element 56, 57 respectively. The springs 52, 53 are secured on one side to a side wall 54, 55 respectively and on the other side to the contra-element. The contra-elements 56, 57 are each provided with a pin 58, 59 respectively which is moveable in a slot 60, 61 in the lid 39. A hole 66, 67 respectively is brought into the walls 64, 65 of the pick-up units 50, 51 so that pins 68, 69 of the robot arm/arms can operate the contra-elements 56, 57 and thus the locking mechanism of the lid so that the container by means of the robot arm can be emptied in its tipped over state.

During picking up of the container by means of the robot arms, see also figure 4, two recesses 73, 74 in the robot arms 71, 72 respectively are brought under the recesses 44, 45 of the front side 43 of the contour part 42. During picking up of the container by the robot arm, the projections 46, 47 are guided by the grooves 10, 11 firstly vertical and thereafter following the sections 12, 13, 14 and 15, 16, 17 respectively to a sloping position. It goes without saying that with an empty weight of 100 kg or more it is virtually impossible for one or more unauthorized persons to remove the container by hand following this simultaneous tilting and tipping movement.

The sloping part 75 of the rear wall of the container preferably guides the rearmost bottom edge thereof in order to prevent damage. In a manner not shown, the lid will open, in the tipped over state of the container, and the rubbish in the container empty into the garbage truck.

In order to clarify the above, a container according to the embodiment shown can be constructed light in weight. Because the container, as it were, hangs on the projections, cost increasing securing elements on the bottom are not necessary.

As is apparant such a container with an empty weight of around 100-150 kg can be produced in an elegant manner from galvanized plate steel parts which are mutually joined by welding. This yields the accompanying advantage that due to the low cost price, replacement of the container of the assembly is relatively simple.

The guiding means 8, 9, 46 and 47 respectively also serve to correctly position the container with respect to the envelope during upwards and downwards movement and also keep the container in the correct position in the rest state.

In a second preferred embodiment of the assembly according to the present invention, an envelope 80 (figure 5) comprises a heavy foot 82, preferably of concrete, which is mounted to fit between paving slabs or stones, on which lying and standing frame elements 82, 83, 84, 85, 86, 87 and 88 respectively are secured. These frame elements can be reinforced in a manner not shown with inclined shore elements which is also of advantage when panels 89, 90 and 91 are releasably secured to the frame parts in such a way that these can be easily replaced when besmirched and/or damaged. This also yields the advantage that the appearance of the envelope 80 can be adjusted to the surroundings in accordance with the wishes of the users, for instance, to take into consideration the atmosphere of the residential area or apartment complex concerned whilst for the rest the design of the cover can be left alone.

The upper side of the foot 81 is preferably somewhat inclined so that rain water, as well as liquid used during cleaning, easily falls off. The placing of the frame parts on a concrete foot 81 has, apart from the weight thereof which makes displacement of the envelope by vandals almost impossible, the further advantage that

the under ends of the steel frame parts 85, 86, 87 and 88 will also stay dry i.e. that they do not continuously come into direct contact with water.

A container 136 according to the second embodiment 101 of the assembly according to the present invention, comprises an engaging plate 102 provided with recesses 103 for engaging a robot arm (packer) of a truck for example, whilst in the upper wall thereof hingable lids 105, 106 are mounted which can be opened in order to deposit waste into the container 100. In the rest position as shown in figure 6, the container 100 is supported on the envelope 80 with a plate part 107 which extends along one side of the container at roughly about the height of the gripping plate 102. A positioning ear 108 is secured to this plate part 107 which acts to ensure that under no conditions the container 100 sinks downwards during sideways displacement of the container 100 in the envelope 80. In a manner not shown the container is also provided, on the opposing side, with a side plate part and a positioning ear which rests upon the joist 82 (see figure 5).

A positioning ring nose 109, preferably made from bent or transformed steel plate, is secured to the rear wall, preferably on the lying frame part 83, behind which a projecting and transformed plate part 110 grips as shown in the figure 6 rest stand so that the container apart from in the rest stand also during the emptying thereof is correctly positioned, i.e. during the upwards and tilting movement thereof towards and from this rest position.

Near the underside the envelope 80 is preferably provided with a frame part 111 which from a practical point of view makes it impossible to displace the container from the envelope by a pushing motion carried out by vandals for example.

The requested rights are in no way limited by the foregoing shown and described embodiments of the present invention, they are rather in the first instance determined by the following claims, many differing possibilities being possible within the scope thereof.

Claims

1. Assembly (34, 101) comprising:

   - at least one container (35, 100) having at least one compartment for the collecting of rubbish provided with engaging means (43, 50, 103) for engaging a robot arm and having a front wall, a rear wall, side walls, a bottom wall and an upper side;
   - an envelope (1, 80) for the container (35, 100), said envelope (1, 80) being securable to the ground;
   - the container (35, 100) and the envelope (1, 80) being provided with cooperating means for guiding the container upwardly out of and downwardly in the envelope (1, 80) upon raising or lowering thereof and for keeping it in the correct position with respect to the envelope (1, 80); the assembly (34, 101) being **characterized in that** the envelope (1, 80) is formed by a back wall (2, 90) and sidewalls (3, 4, 91, 89) with an open top and front side, the front wall of the container being provided with the robot arm engaging means (43, 50, 103), whereby a robot arm is able to engage said engaging means through the open front side of the envelope and to raise said container (35, 100) out of the envelope (1, 80) before tilting it.

2. Assembly (101) according to claim 1, wherein the co-operating means comprise an envelope frame part (111) extending between the side-walls (91-89) of the envelope (80) opposite the back wall (90) of the envelope (80).

3. Assembly according to claim 1 or 2, wherein the co-operating means for guiding the container into and out of the envelope comprise at least one slot (8, 9) on the inner side of the envelope and at least one projecting part (46, 47) on the outer side of the container, which is guidable in the slot (8, 9) wherein the slot is V-like in shape and the V-shape narrows in a downwards direction.

4. Assembly according to claims 1, 2 or 3, wherein the walls (89, 90, 91) of the envelope are mounted in a steel frame.

5. Assembly according to claim 4, wherein the frame is secured on a concrete foot (81).

6. Assembly according to claim 5, wherein the container walls comprise releasable panels (89, 90, 91) which are releasable from the frame.

7. Assembly according to any of the preceding claims wherein the co-operating means comprise one or more ears (108) mounted to each side wall of the container.

8. Assembly according to any of the preceding claims wherein the co-operating means comprise a nose (109) on the rear wall of the envelope.

Patentansprüche

1. Aufbau (34, 101), der aufweist:

   - mindestens einen Behälter (35, 100) mit mindestens einem Fach zum Sammeln von Abfall, der mit einem Eingriffsmittel (43, 50, 103) zum Eingreifen mit einem Roboterarm vorgesehen ist und eine Frontwand, eine Rückwand, Seitenwände, eine Bodenwand und eine Ober-

seite aufweist;

- eine Umhüllung (1, 80) für den Behälter (35, 100), wobei die Umhüllung (1, 80) an dem Untergrund sicherbar ist;
- wobei der Behälter (35, 100) und die Umhüllung (1, 80) mit zusammenwirkenden Mitteln zum Führen des Behälters nach oben aus der und nach unten in die Umhüllung (1, 80) beim Anheben oder Absenken desselben und zum Halten desselben in der korrekten Position bezüglich der Umhüllung (1, 80) vorgesehen sind; wobei der Aufbau (34, 101) dadurch gekennzeichnet ist, daß die Umhüllung (1, 80) durch eine Rückwand (2, 90) und Seitenwände (3, 4, 91, 89) mit einer offenen Ober- und Frontseite ausgebildet ist, wobei die Frontwand des Behälters mit dem Roboterarm-Eingriffsmittel (43, 50, 103) vorgesehen ist, wodurch ein Roboterarm in der Lage ist, in Eingriff mit dem Eingriffsmittel durch die offene Frontseite der Umhüllung in Eingriff zu kommen und den Behälter (35, 100) aus der Umhüllung (1, 80) zu heben, bevor er geneigt wird.

2. Aufbau (101) nach Anspruch 1, bei dem das zusammenwirkende Mittel einen Umhüllungsrahmenteil (111), der sich zwischen den Seitenwänden (91-89) der Umhüllung (80) gegenüber der Rückwand (90) der Umhüllung (80) erstreckt, aufweist.

3. Aufbau nach Anspruch 1 oder 2, bei dem das zusammenwirkende Mittel zum Führen des Behälters in die und aus der Umhüllung mindestens einen Schlitz (8, 9) auf der Innenseite der Umhüllung und mindestens einen vorstehenden Teil (46, 47) auf der Außenseite des Behälters, das in dem Schlitz (8, 9) führbar ist, aufweist, bei dem der Schlitz V-artig in der Form ist und sich die V-Form in einer Richtung nach unten verengt.

4. Aufbau nach Anspruch 1, 2 oder 3, bei dem die Wände (89, 90, 91) der Umhüllung in einem Stahlrahmen montiert sind.

5. Aufbau nach Anspruch 4, bei dem der Rahmen auf einem Betonfuß (81) gesichert ist.

6. Aufbau nach Anspruch 5, bei dem die Behälterwände lösbare Paneele (89, 90, 91) aufweisen, die von dem Rahmen lösbar sind.

7. Aufbau nach einem der vorhergehenden Ansprüche, bei dem das zusammenwirkende Mittel ein oder mehrere Ohren (108) aufweist, die auf jeder Seitenwand des Containers montiert ist.

8. Aufbau nach einem der vorhergehenden Ansprüche, bei dem das zusammenwirkende Mittel eine Nase (109) auf der Rückwand der Umhüllung aufweist.

Revendications

1. Ensemble (34, 101) comprenant :

   - au moins un récipient (35, 100) ayant au moins un compartiment pour la collecte d'ordures, comprenant un dispositif d'engrènement (43, 50, 103) destiné à l'engrènement avec un bras de robot et ayant une paroi avant, une paroi arrière, des parois latérales et une paroi inférieure et une face supérieure,
   - une enveloppe (1, 80) destinée au récipient (35, 100), l'enveloppe (1, 80) étant solidarisable au sol,
   - le récipient (35, 100) et l'enveloppe (1, 80) ayant des dispositifs de coopération destinés à guider le récipient vers le haut afin qu'il sorte de l'enveloppe (1, 80) et vers le bas afin qu'il pénètre dans l'enveloppe lors du soulèvement ou de l'abaissement du récipient et afin qu'il garde une position convenable par rapport à l'enveloppe (1, 80), l'ensemble (34, 101) étant caractérisé en ce que l'enveloppe (1, 80) est formée par une paroi arrière (2, 90) et des parois latérales (3, 4, 91, 89) avec une face avant et supérieure ouverte, la paroi avant du récipient ayant un dispositif (43, 50, 103) d'engrènement avec un bras de robot, si bien qu'un bras de robot peut être en engrènement avec le dispositif d'engrènement par la face avant ouverte de l'enveloppe et peut soulever le récipient (35, 100) pour le sortir de l'enveloppe (1, 80) avant de le faire basculer.

2. Ensemble (101) selon la revendication 1, dans lequel le dispositif de coopération comprend une partie (111) de châssis d'enveloppe disposée entre ces parois latérales (91-89) de l'enveloppe (80) du côté opposé à la paroi arrière (90) de l'enveloppe (80).

3. Ensemble selon la revendication 1 ou 2, dans lequel le dispositif de coopération destiné à guider le récipient dans l'enveloppe et hors de celle-ci comporte au moins une fente (8, 9) placée à la face interne de l'enveloppe et au moins une partie en saillie (46, 47) placée à la face externe du récipient et qui peut être guidée dans la fente (8, 9), la fente ayant une forme en V et la forme en V se rétrécissant vers le bas.

4. Ensemble selon la revendication 1, 2 ou 3, dans lequel, les parois (89, 90, 91) de l'enveloppe sont montées dans un châssis d'acier.

5. Ensemble selon la revendication 4, dans lequel le châssis est fixé à un pied de béton (81).

6. Ensemble selon la revendication 5, dans lequel les parois du récipient comportent des panneaux amovibles (89, 90, 91) qui peuvent être séparés du châssis.

7. Ensemble selon l'une quelconque des revendications précédentes, dans lequel le dispositif de coopération comporte une ou plusieurs oreilles (108) montées sur chaque paroi latérale du récipient.

8. Ensemble selon l'une quelconque des revendications précédentes, dans lequel le dispositif de coopération comporte un nez (109) placé à la paroi arrière de l'enveloppe.

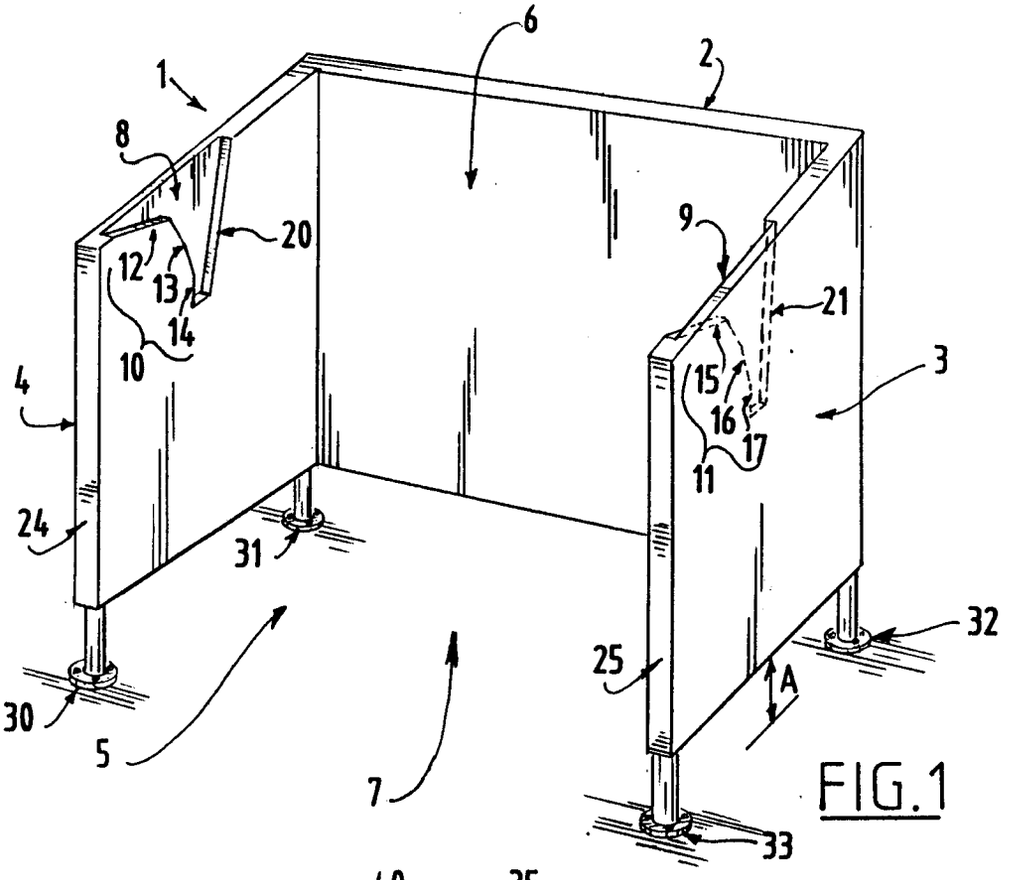
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FIG.1

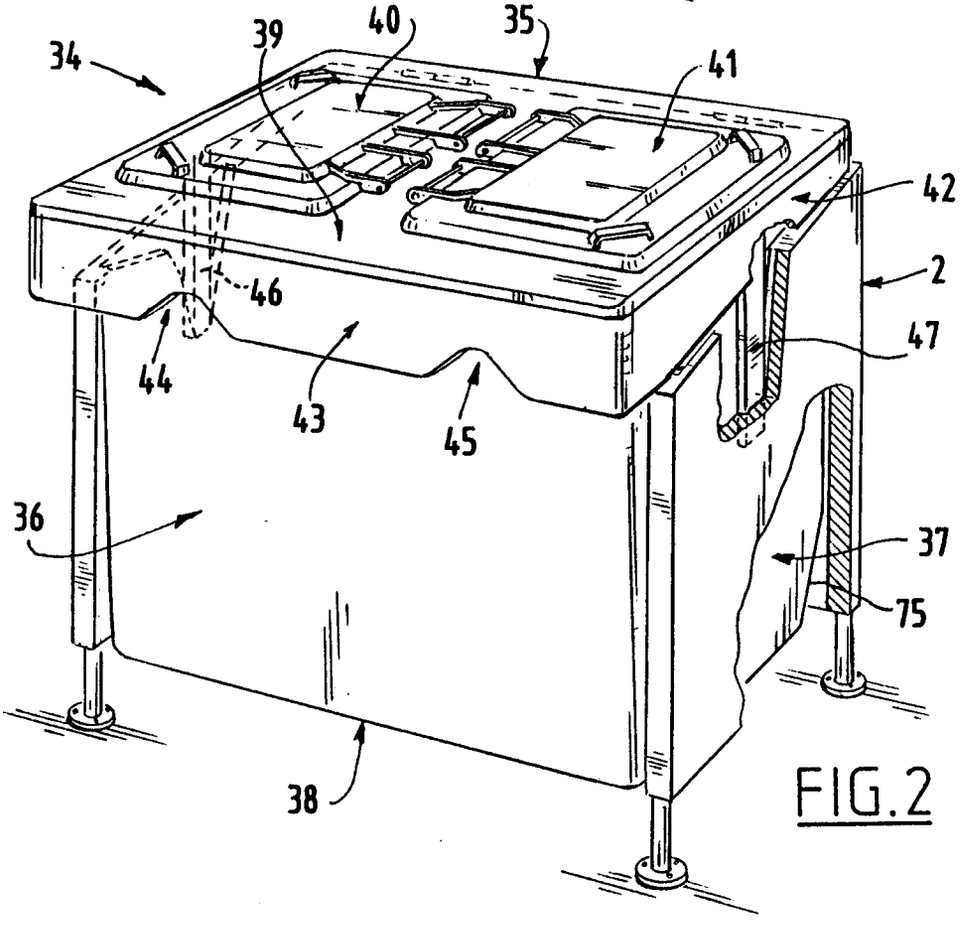
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FIG.2

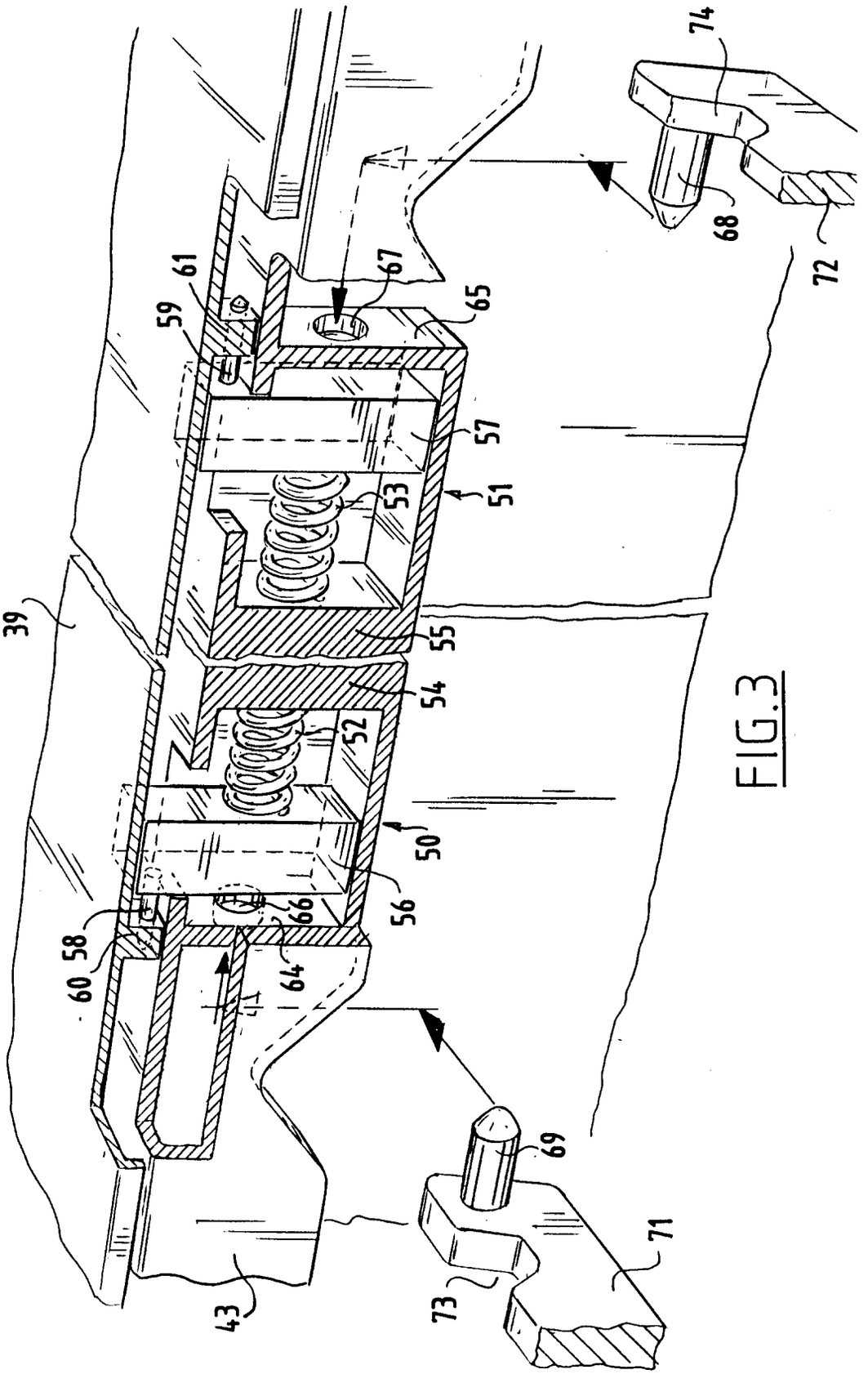

FIG.3

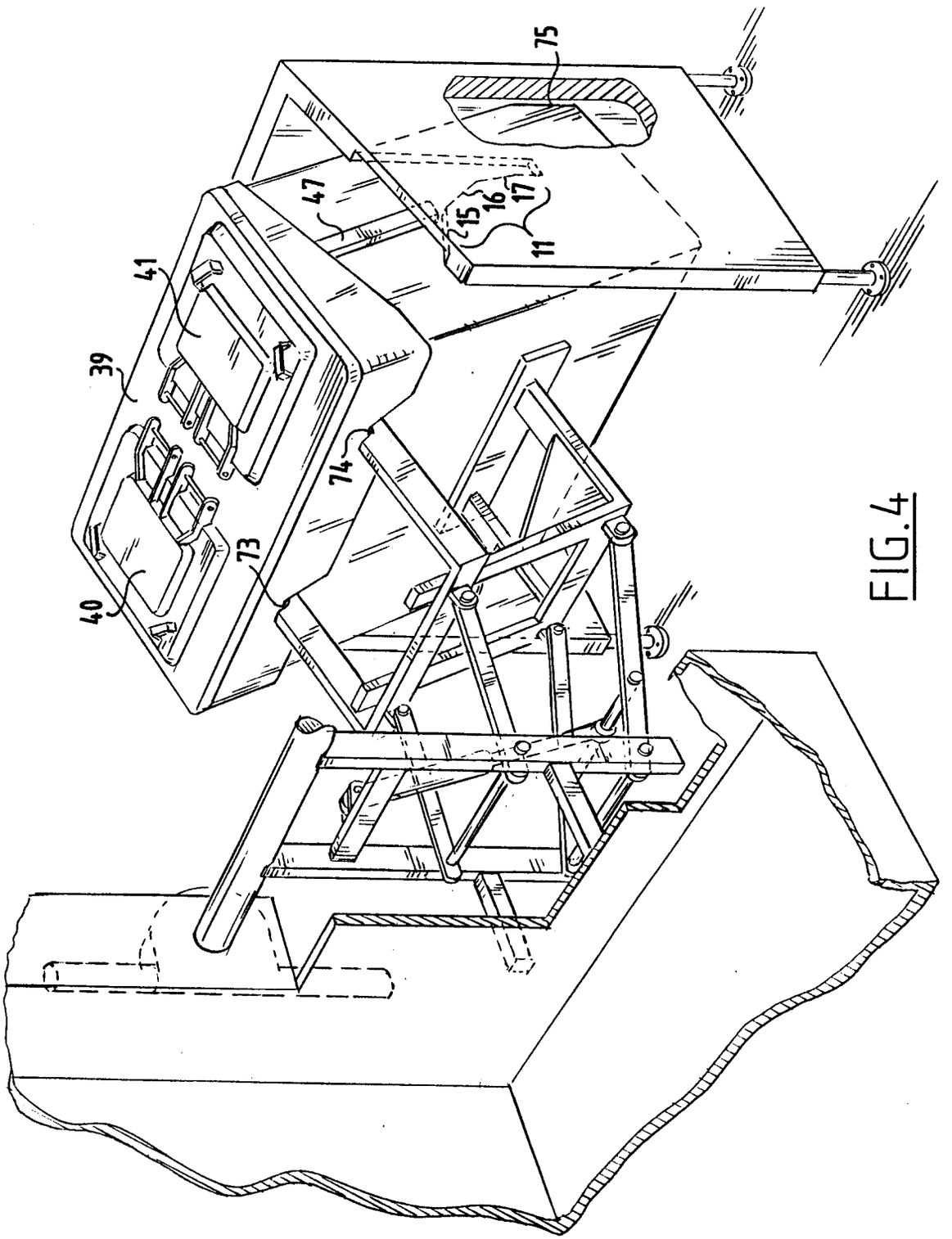

FIG.4

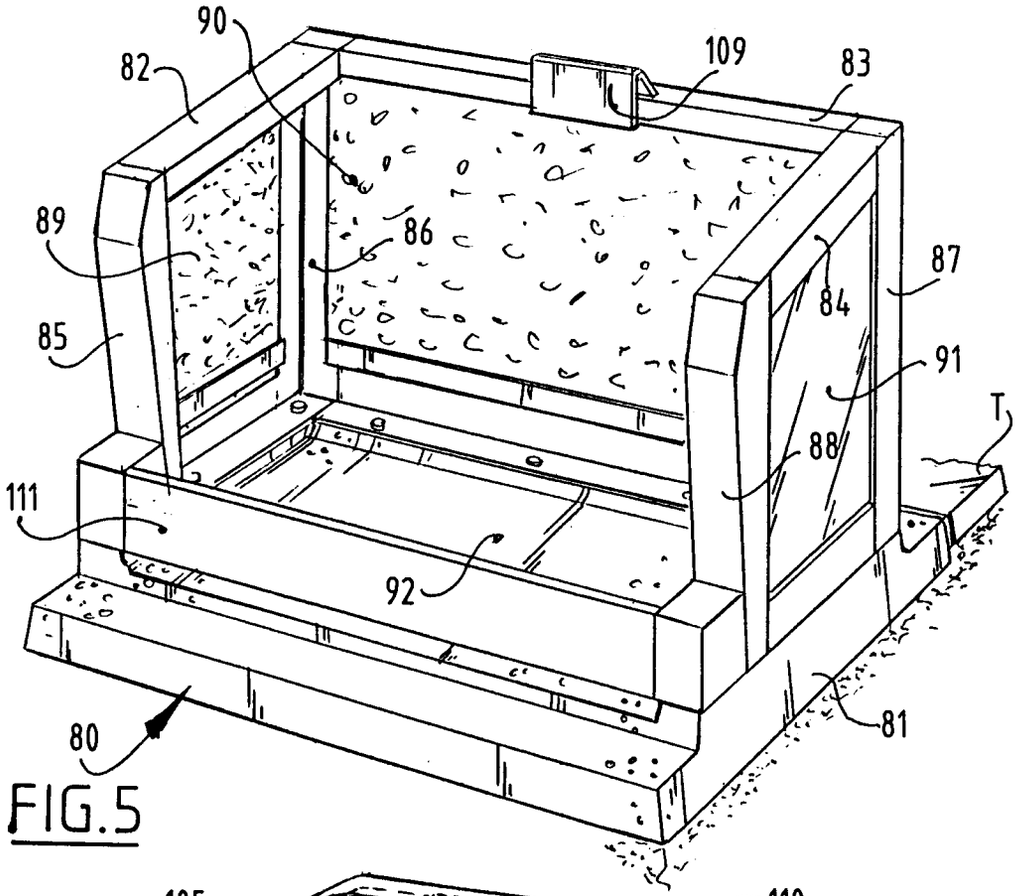
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FIG.5

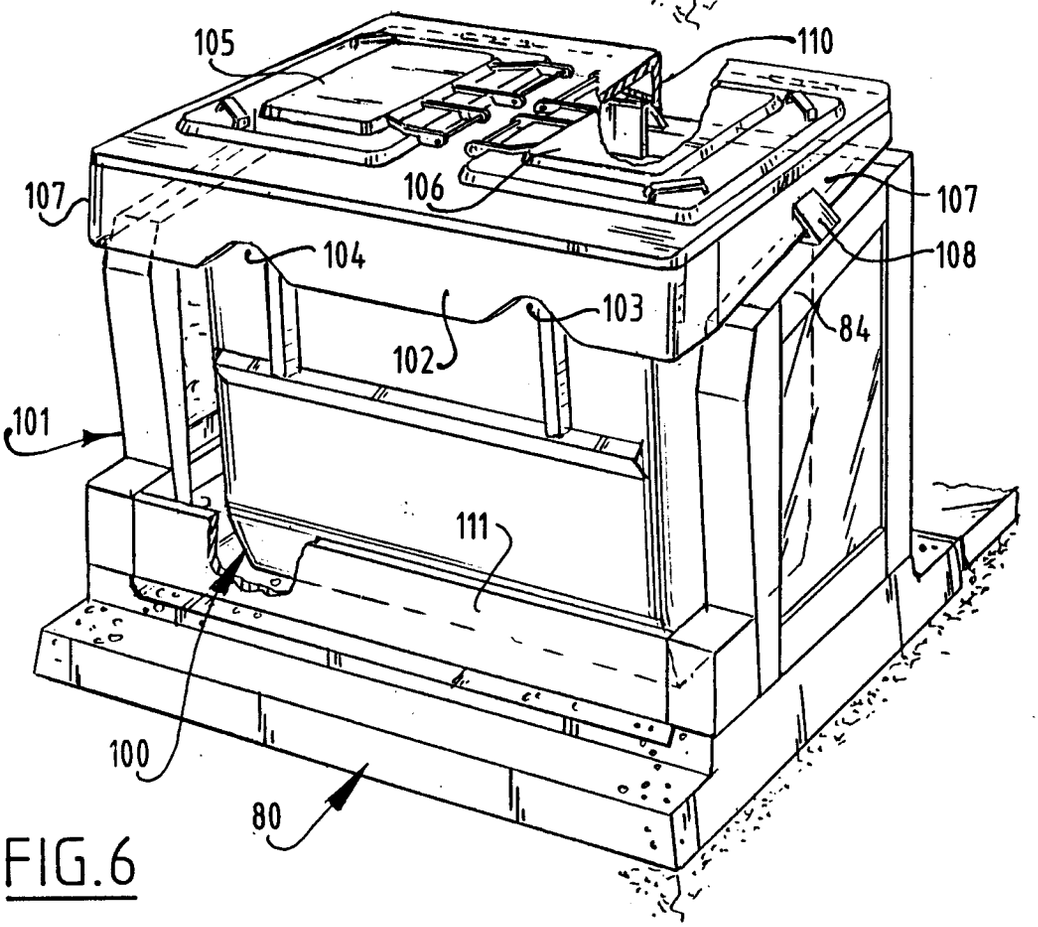
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FIG.6