(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 647 573 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **94202912.5**

(51) Int. Cl.[6]: **B65F 1/14**

(22) Date of filing: **07.10.94**

(30) Priority: **07.10.93 NL 9301728**

(43) Date of publication of application:
12.04.95 Bulletin 95/15

(84) Designated Contracting States:
BE DE ES FR GB IT NL

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

(57) The present invention relates to an assembly comprising

- at least one container with at least one compartment for the collecting of rubbish provided with engaging means for engaging a robot arm for the raising and tilting of the container;
- a securable envelope for the container, wherein the assembly is provided with positioning means for bringing into and keeping in the correct position the container with respect to the envelope.

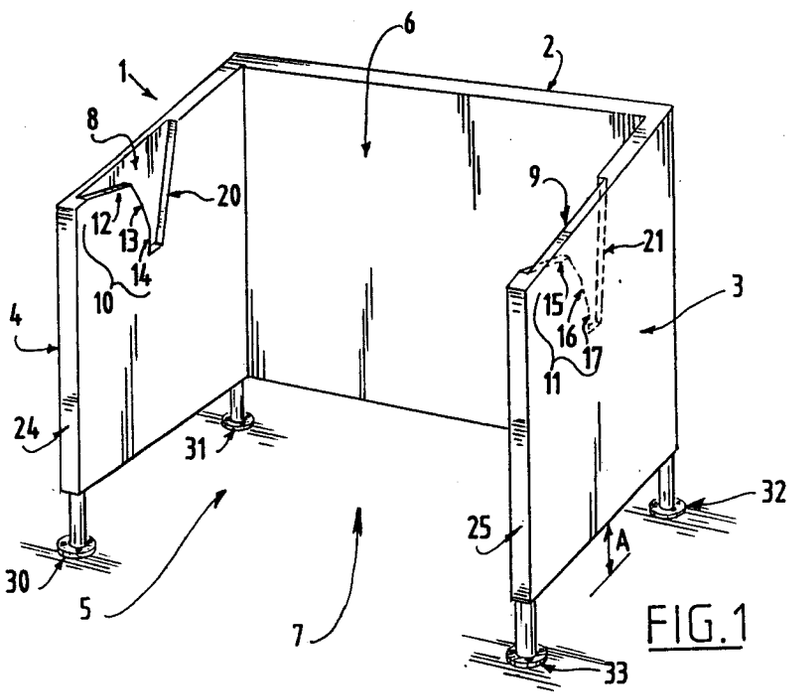

FIG.1

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The present invention relates to containers, preferably for collecting rubbish, which 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. In this way 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.

The present invention provides, according to a first aspect, an apparatus comprising:

- at least one container with at least one compartment for collecting rubbish, provided with engaging means for engaging a robot arm for raising and tilting the container;
- a secure envelope for the container, wherein the assembly is provided with positioning means for bringing into and keeping in the correct position the container with respect to the envelope.

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.

The present invention also provides, according to a second aspect, an envelope, preferably for use with the above mentioned assembly.

The present invention provides according to a third aspect a rubbish container, preferably for cooperation with the assembly and/or the envelope as mentioned above.

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 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 comprising:
- at least one container with at least one compartment for the collecting of rubbish provided with engaging means for engaging a robot arm for raising and tilting the container;
- a securable envelope for the container, wherein the assembly is provided with positioning means for bringing into and keeping in the correct position the container with respect to the envelope.

2. Assembly according to claim 1, provided with guiding means for guiding the container into and out of the envelope.

3. Assembly according to claim 2, wherein the guiding means comprise at least one slot on the inner side of the envelope and at least one projecting part on the outer side of the container, which is guidable in the slot.

4. Assembly according to claim 3, wherein the slot is V-like in shape and the V-shape narrows in a downwards direction.

5. Assembly according to claims 2, 3 or 4, wherein, at rest, the container is held by the envelope at a distance above the ground.

6. A concrete rubbish container envelope of such a weight, that the container is not tiltable when placed on the ground.

7. Envelope for a rubbish container according to claim 6, provided with one or more feet for keeping the walls of the container at a distance from the ground and securing means for securing the envelope to the ground via the feet.

8. Envelope according to claim 7, wherein the securing means comprise screwable bolts.

9. Container provided with at least one compartment for collecting rubbish, engaging means for engaging a robot arm and at least one projecting part secured to the container in such a way, that it can be suspended thereby.

10. Container according to claim 9, provided with a first lid for opening, closing respectively of the upper side of the container, said lid being hingable with respect to one of the sidewalls of the container, and with locking means for locking the lid in a closed position, the locking means being operable by the robot arm.

11. Container according to claims 9 or 10, provided with two or more compartments and two or more lids, each for the opening and closing respectively of one compartment, wherein the two second lids are hingably mounted in the first lid.

12. Assembly according to any of the claims 1-5, provided with an envelope according to any one of the claims 6, 7 or 8 and/or a container according to claims 9, 10 or 11.

13. Assembly according to claim 1, wherein the envelope comprises a steel frame.

14. Assembly according to claim 13, wherein the frema is secured on a concrete foot.

15. Assembly according to claims 13 or 14, wherein releasable panels are mounted against the frame.

16. Assembly according to claims 13, 14 or 15, wherein one or more ears which are mounted to each side wall of the container, make up part of the positioning means.

17. Assembly according to any of the claims 13-16, wherein a nose on the rear wall of the envelope makes up part of the positioning means.

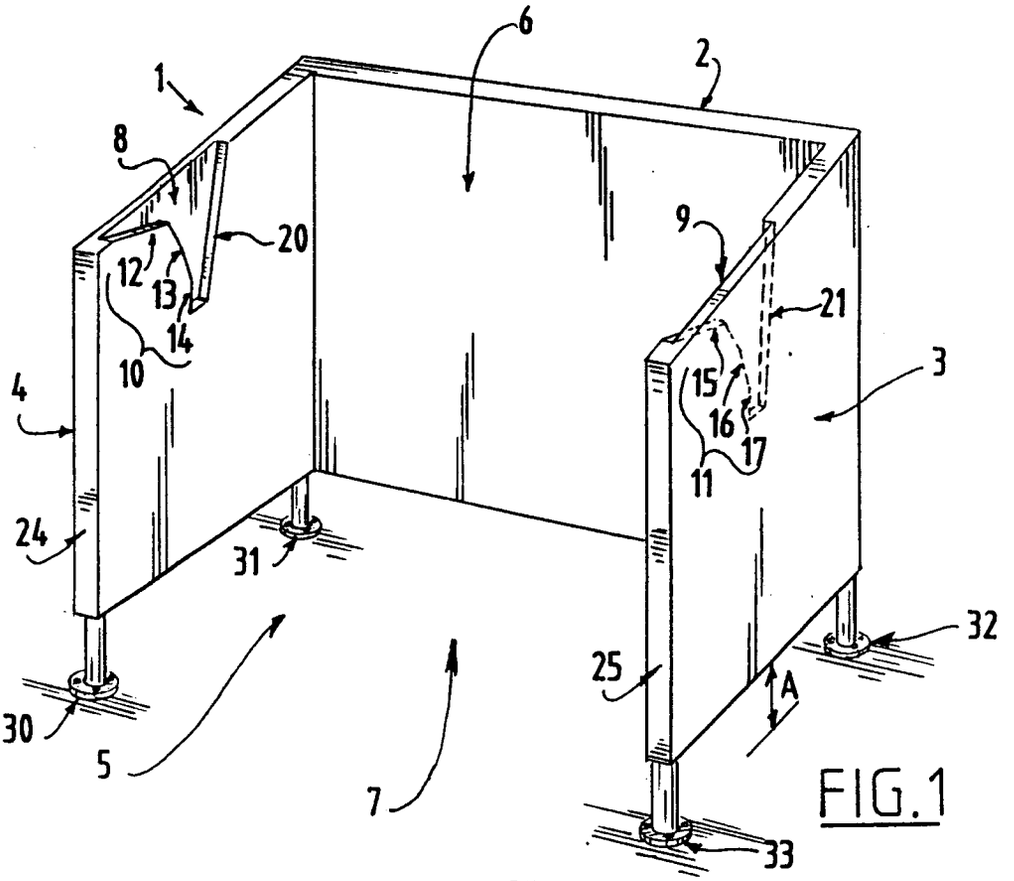
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FIG.1

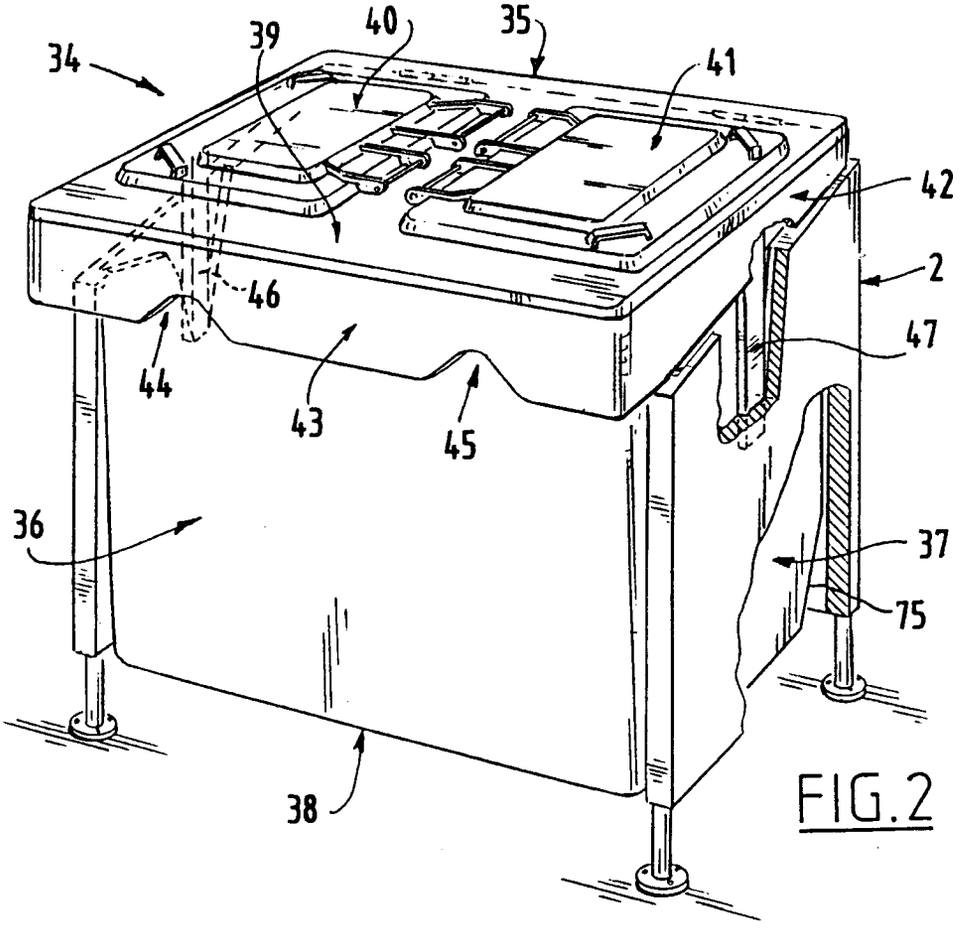
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FIG.2

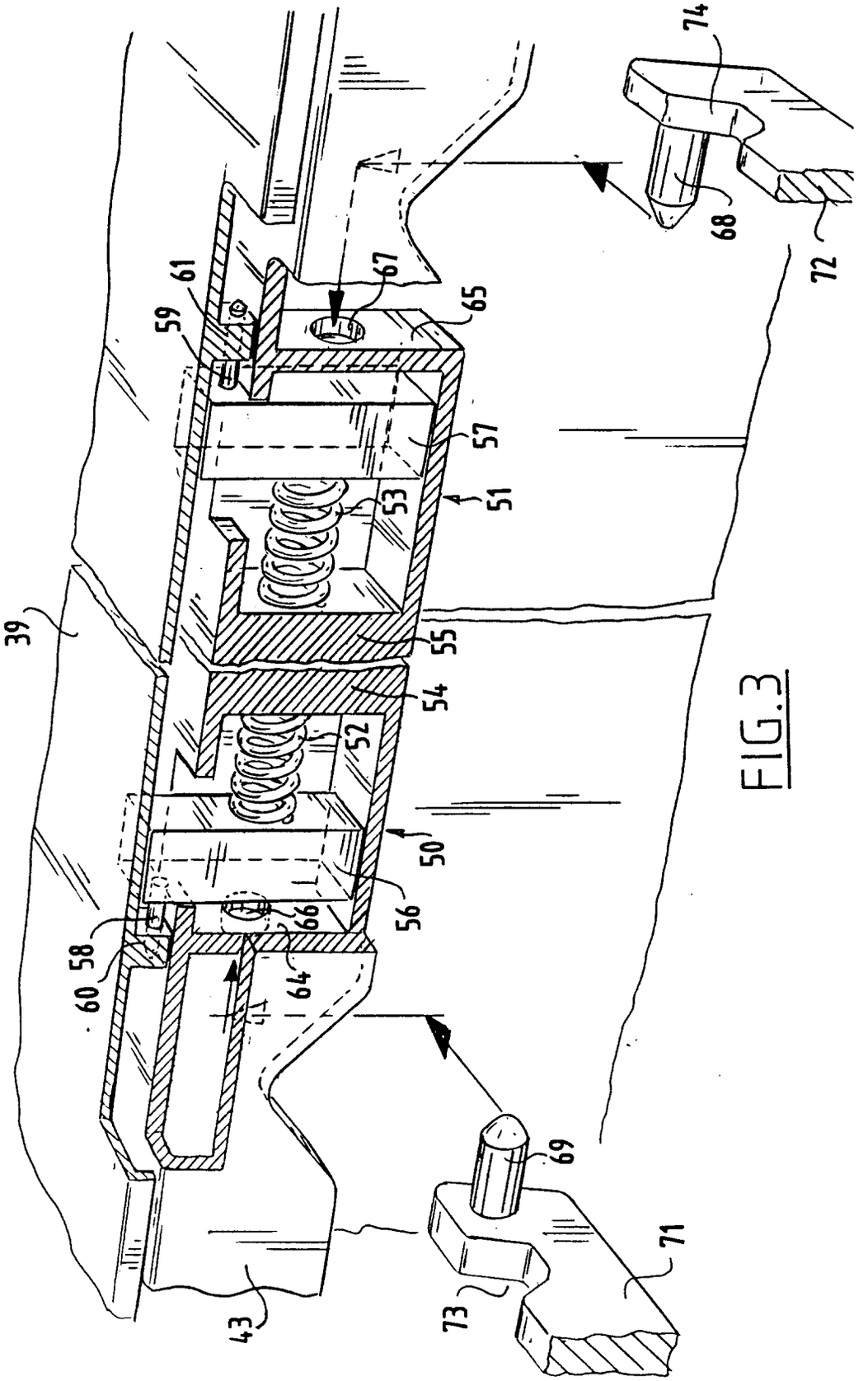

FIG.3

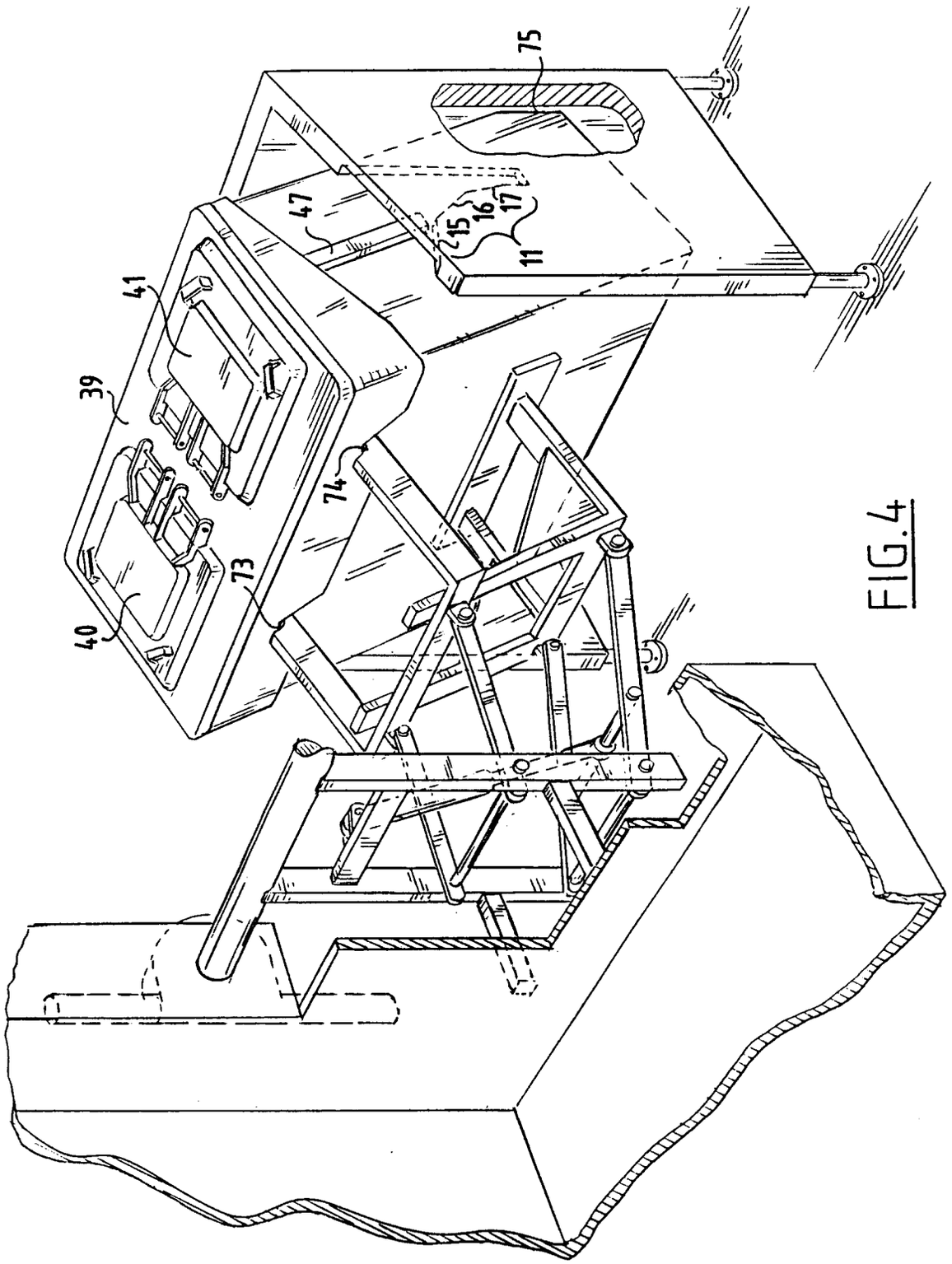

FIG.4

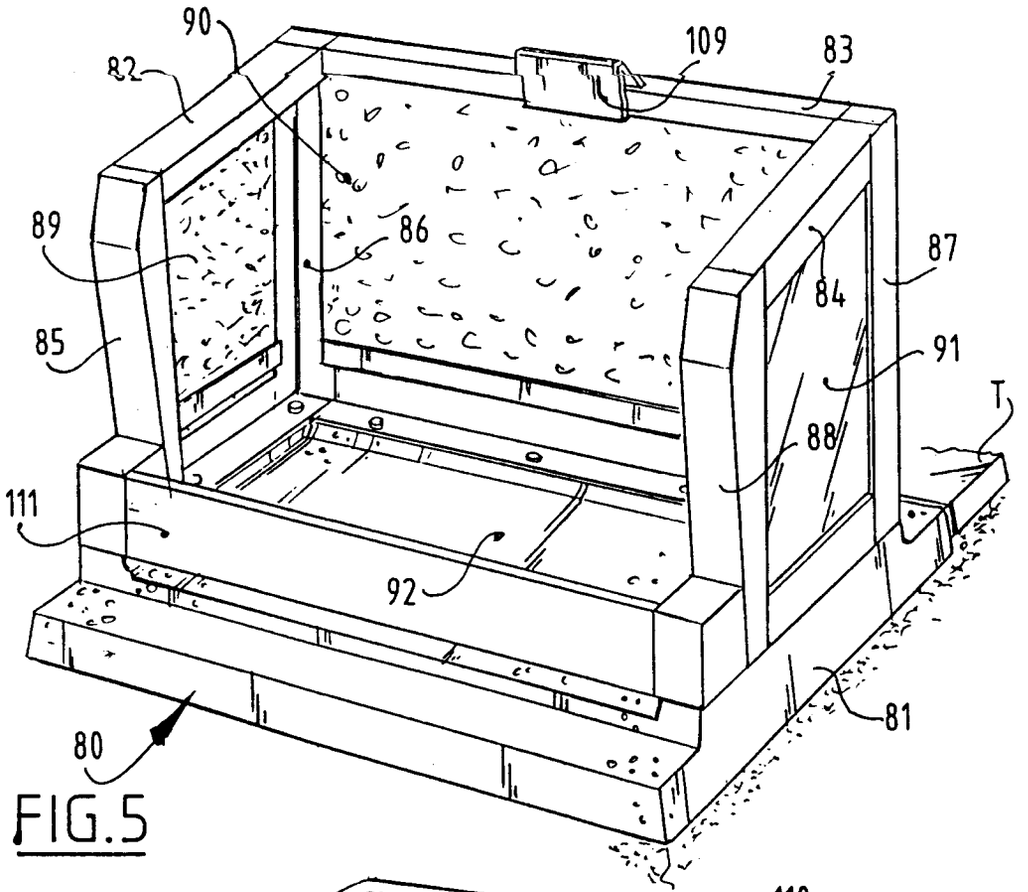
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FIG.5

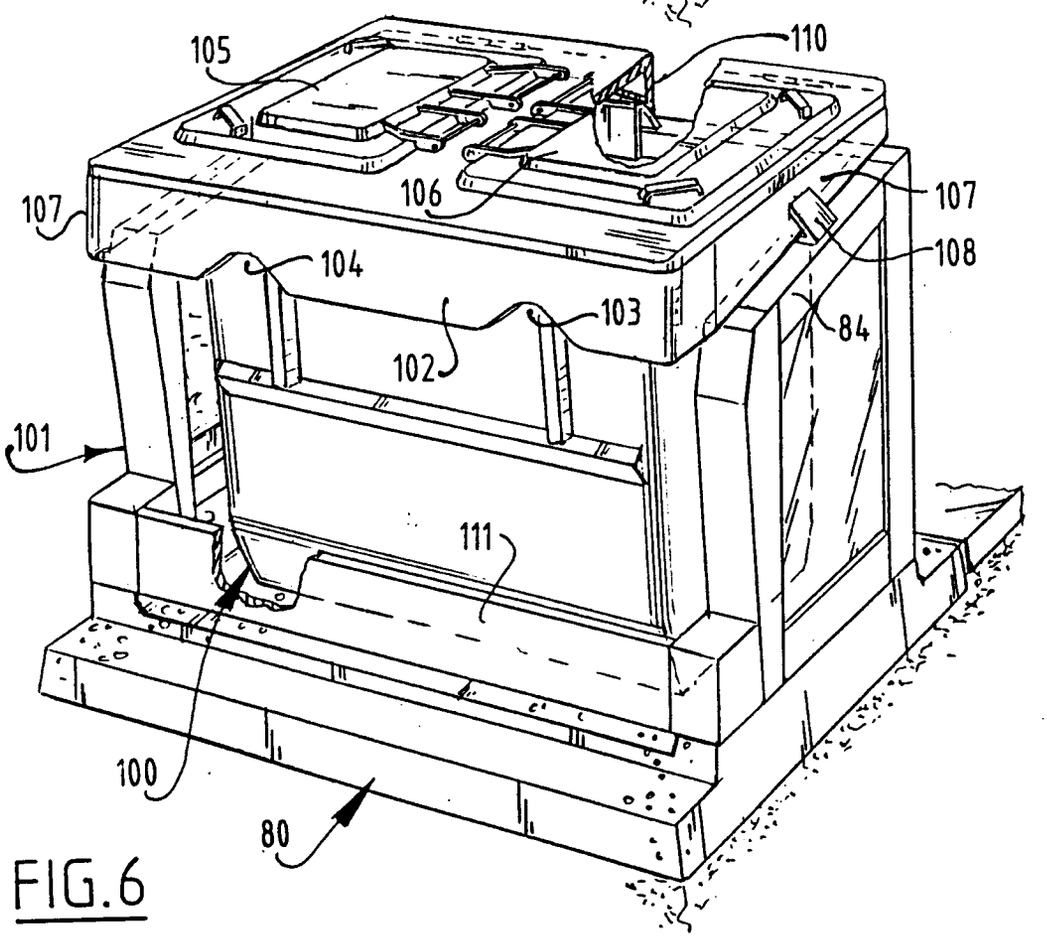
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FIG.6