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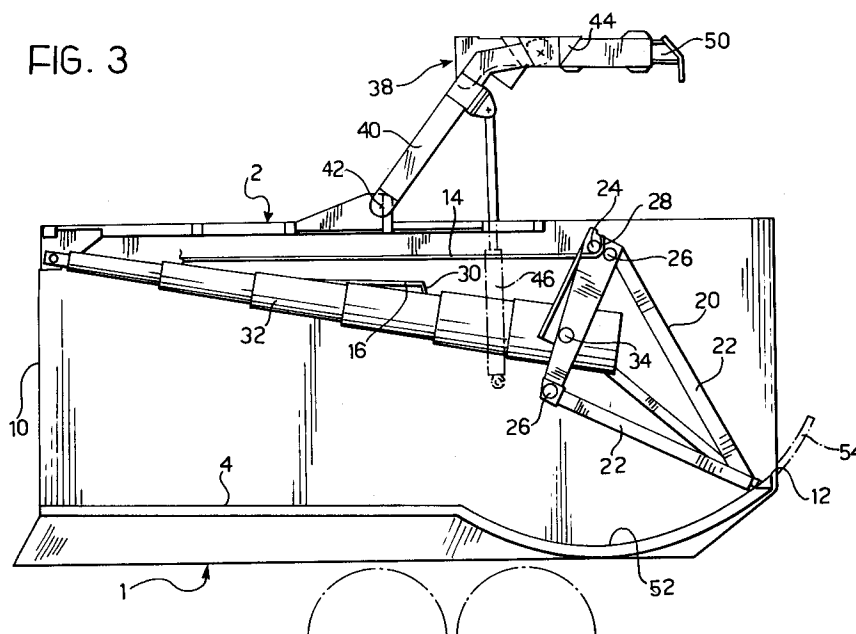
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I-10121 Torino(IT)(54) **A vehicle for the loading, compacting and discharge of refuse.**

(57) The vehicle includes a body (2) which has an opening (12) at its rear and contains a pair of superposed longitudinal guides (14, 16) along which a plate (20) can slide to discharge the refuse. The movable plate (20) carries a first pair of rollers (24) which run along the first guide (14) and two pairs of rollers (26) which run along the second guide (16).

The second rollers (26) are disengaged from the second guide (16) when the first rollers (24) contact a stop (28) at the rear end of the first guide (14). The further operation of the actuator (32) which moves the plate thus causes the plate (20) to pivot about a transverse axis which passes through the end-of-travel position of the first rollers (24).

FIG. 3



The present invention relates to a vehicle for the loading, compacting and discharge of refuse.

More specifically, the invention relates to a vehicle of the type including:

- a load-carrying body which is carried by the structure of the vehicle and has a top wall and a bottom wall connected by a pair of side walls and a front wall, the body also having an opening at its rear for the loading and discharge of the refuse,
- a first longitudinal guide adjacent the top wall and a second guide parallel to the first,
- a plate for discharging the refuse, the plate being movable within the body between a first position adjacent the front wall and a second position in which it is in correspondence with the rear opening, and having first and second engagement means which connect it slidably to the first and second guides, respectively, and
- actuator means for moving the plate between its first and second positions.

A vehicle of the type specified above is known from the present Applicant's Italian utility model application No. 52883-B/81. This document describes a vehicle with a body which has upper and lower guides on which a movable plate is slidable. The bottom wall of the body has an upwardly curved end portion so that the vehicle can transfer the refuse into the body of a larger vehicle whose load opening is at a greater height. The lower guide extends along the entire length of the bottom wall as far as the rear opening. The movable plate is permanently engaged on both the guides and, during the expulsion of the refuse, pivots upwardly by virtue of the curvature of the lower guide.

In order to provide a vehicle which is simpler and more reliable than the known vehicle described above, the subject of the present invention is a vehicle of the type specified at the beginning, characterised in that the first longitudinal guide has a stop near its rear end, and in that the rear end of the second guide is further forward than the rear end of the first guide so that the movement of the movable plate towards its second position causes the second engagement means to be disengaged from the second guide when the first engagement means contact the stop on the first guide, the further operation of the actuator means thus causing the movable plate to pivot about a transverse axis which passes through the end-of-travel position of the first engagement means.

Translatory and rotatory movements of the movable plate can thus be achieved simply by rectilinear guides which do not need to be produced with particular accuracy.

In a preferred embodiment, the discharge plate is inclined to the vertical with its lower edge further

forward than its upper edge and, adjacent the rear opening, the bottom wall of the body has an end portion with the profile of an arc of a circle the centre of which coincides substantially with the axis about which the movable plate pivots, the end portion being at least partially recessed relative to the rest of the bottom wall. By virtue of this characteristic, the discharge edge of the rear opening can be kept at a lower level which facilitates the manual loading of the refuse.

The vehicle according to the invention preferably includes a panel articulated to the rear loading edge of the body, and having a profile corresponding to that of the end portion of the bottom wall. When the contents of the body are to be transferred into the body of a larger vehicle, the panel is raised to form an extension of the bottom wall. The loading edge is thus raised to the level of the loading edge of the larger vehicle.

Further characteristics and advantages of the present invention will become clear in the course of the detailed description which follows with reference to the appended drawings in which Figures 1, 2 and 3 are schematic sections showing the operating sequence of the vehicle according to the invention.

With reference to the drawings, a vehicle for the loading, compacting and discharge of refuse is indicated 1. The vehicle 1 has a body 2 which is fixed to the structure of the vehicle. The body 2 is constituted essentially by a bottom wall 4, a top wall 6, a pair of side walls 8, and a front wall 10. An opening at the rear, through which the refuse is loaded into the body and discharged in the manner which will be described below, is indicated 12.

The body 2 has a pair of guides 14, 16 adjacent its top wall 6. Each guide 14, 16 is constituted by a pair of tracks fixed to the respective side walls 8 of the body 2.

Within the body 2 is a movable plate 18 which is carried by a support structure 20 with a right-angled triangular cross-section. The base of the triangular structure 22 is slidable on the guides 14, 16 by means of first and second engagement means which, in the embodiment illustrated in the drawings, are constituted by rollers 24, 26 which are rotatable on the structure 22.

The rear end of the upper guide 14 has a stop 28 which the rollers 24 running on the tracks constituting the upper guide 14 are intended to abut. The rear end of the lower guide 16 is further forward than the rear end of the upper guide 14. The distance between the rear ends of the upper and lower guides 14, 16 must be equal to or greater than the distance between the rear and front rollers 24, 26 so that the front rollers 26 can be disengaged from the lower guide 16 when the rear rollers contact the stop 28. The rear end of the

lower guide 16 has a lead-in portion 30, the function of which will become clear from the following.

The structure 22 is made to slide along the guides 14, 16 by a multi-sectioned hydraulic cylinder 32. The body of the cylinder 32 is articulated to the structure 22 at 34 and the end 36 of the cylinder 32 is articulated to the body 2 at 36.

Outside the body 2 is a compacting device 38 including a pair of arms 40 (only one of which is visible in the drawings) which are articulated to the top wall 6 of the body 2 at 42. A hollow compacting plate 44, in which a plate 50 is slidable telescopically, is articulated to the free ends of the arms 40. The arms 40 are operated by a pair of hydraulic cylinders 46 which are articulated on the side walls 8 of the body 2. A hydraulic cylinder 48 (see Figure 2) is interposed between the top wall of the body and the compacting plate 44. A hydraulic cylinder, not visible in the drawings, is disposed in the compacting plate 41 and controls the sliding of the telescopic plate 50.

The bottom wall 4 of the body 2 has an end portion 52 with the profile of an arc of a circle the centre of which lies in correspondence with the rear end of the upper guide 14. The end portion 52 is recessed relative to the rest of the bottom wall 4. This geometry reduces the height of the loading edge of the rear opening 12, thus facilitating the loading of the refuse into the body 2. A panel, indicated 54, which can be lowered is articulated to the body 2 in correspondence with the loading edge of the rear opening 12. In order to transfer the refuse in the body 2 into the body of a larger vehicle, the panel 54 is brought to the position shown in Figure 4 so as to raise the lower edge of the opening 12 and bring it to the same height as the loading edge of the larger body. The profile of the panel 54 corresponds to that of the end portion 52 of the bottom wall 4.

In Figure 1, the vehicle 1 is in the loading position. The movable plate 20 is at the rear end of the guide 14 and the plate 50 is within the compacting plate 44 so as not to obstruct the loading of the refuse through the rear opening 12. A loading device of known type (not shown) at the rear end of the body 2 picks up a container of refuse and tips its contents into the body 2 through the rear opening 12.

Figure 2 shows the operating sequence of the compacting device 38. The sliding plate 50 is first extended and the compacting plate 44 is then pivoted by means of the hydraulic cylinder 48. The operating cycle of the compacting device is described in greater detail in the Italian patent application No. TO91A000359 by the present applicant.

As the refuse is gradually compressed in the body 2 by the compacting device 38, the movable

plate 20 moves towards the front end of the body, against a reacting force generated by the cylinder 32, until it is brought against the front wall 10 as shown in Figure 2.

When the body 2 is full, the refuse is discharged by the operation of the multi-sectioned cylinder 32 which slides the structure 22 carrying the plate 20. When the rear rollers 24 contact the stop 28 on the upper guide 14, the front rollers 26 are disengaged from the lower guide 16. The further operation of the cylinder 32 causes the structure 22 to pivot about a transverse axis which passes through the pins of the rollers 24 until it reaches the position shown in Figure 3. It will be understood from an observation of the pivoting movement performed by the plate 20, that the profile of the end portion 52 of the bottom wall 4 is recessed because of the need to allow for the pivoting of the plate 20 which, in the loading position shown in Figures 1 and 2, is inclined to the vertical with its lower edge further forward than its upper edge. The purpose of the lead-in 30 at the rear end of the lower guide 16 is to return the rollers 26 into engagement with the guide 16 when the structure 22 is retracted.

When the contents of the body 2 have to be discharged into the body of a larger vehicle, the panel 54 is raised to the position shown in Figure 4 and the cylinder 32 continues to be operated until the lower edge of the plate 20 is in correspondence with the end of the panel 54.

Claims

1. A vehicle for the loading, compacting and discharge of refuse, including:
 - a load-carrying body (2) which is carried by the structure of the vehicle and has a top wall (6) and a bottom wall (4) connected by a pair of side walls (8) and a front wall (10), the body (2) also having an opening (12) at its rear for the loading and discharge of the refuse,
 - a first longitudinal guide (14) adjacent the top wall (6) and a second guide (16) parallel to the first,
 - a plate (20) for discharging the refuse, the plate (20) being movable within the body (2) between a first position adjacent the front wall and a second position in which it is in correspondence with the rear opening (12), and having first and second engagement means (24, 26) which connect it slidably to the first and second guides (14, 16), respectively, and
 - actuator means (32) for moving the plate (20) between its first and second positions,

characterised in that the first longitudinal guide (14) has a stop (28) near its rear end, and in that the rear end of the second guide (16) is further forward than the rear end of the first guide (14) so that the movement of the movable plate (20) towards its second position causes the second engagement means (26) to be disengaged from the second guide (16) when the first engagement means (24) contact the stop (28) on the first guide (14), the further operation of the actuator means thus causing the movable plate (20) to pivot about a transverse axis which passes through the end-of-travel position of the first engagement means (24).

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2. A vehicle according to Claim 1, characterised in that the discharge plate (20) is inclined to the vertical with its lower edge further forward than its upper edge, and in that, adjacent the rear opening (12), the bottom wall (4) of the body (2) has an end portion (52) with the profile of an arc of a circle the centre of which coincides substantially with the axis about which the movable plate (20) pivots, the end portion (52) being at least partially recessed relative to the rest of the bottom wall (4).
3. A vehicle according to Claim 2, characterised in that it includes a panel (54) articulated in correspondence with the rear loading edge of the body (2) and has a profile corresponding to that of the end portion (52) of the bottom wall (4).
4. A vehicle according to Claim 1, characterised in that it includes a compacting device (38) including a pair of arms (40) which are articulated to the outer portion of the top wall (6) and a hollow compacting plate (44) which is articulated to the free ends of the arms (40) and carries within it a telescopically slidable plate (50).
5. A vehicle according to Claim 1, characterised in that the second guide (16) is disposed immediately beneath the first guide (14) and has a lead-in portion (30) at its rear end.
6. A vehicle according to Claim 2, characterised in that the movable plate (20) is carried by a structure (22) which has a right-angled triangular cross-section, the base of which slides along the guides (14, 16) and the vertex of which is adjacent the bottom wall (4).

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FIG. 1

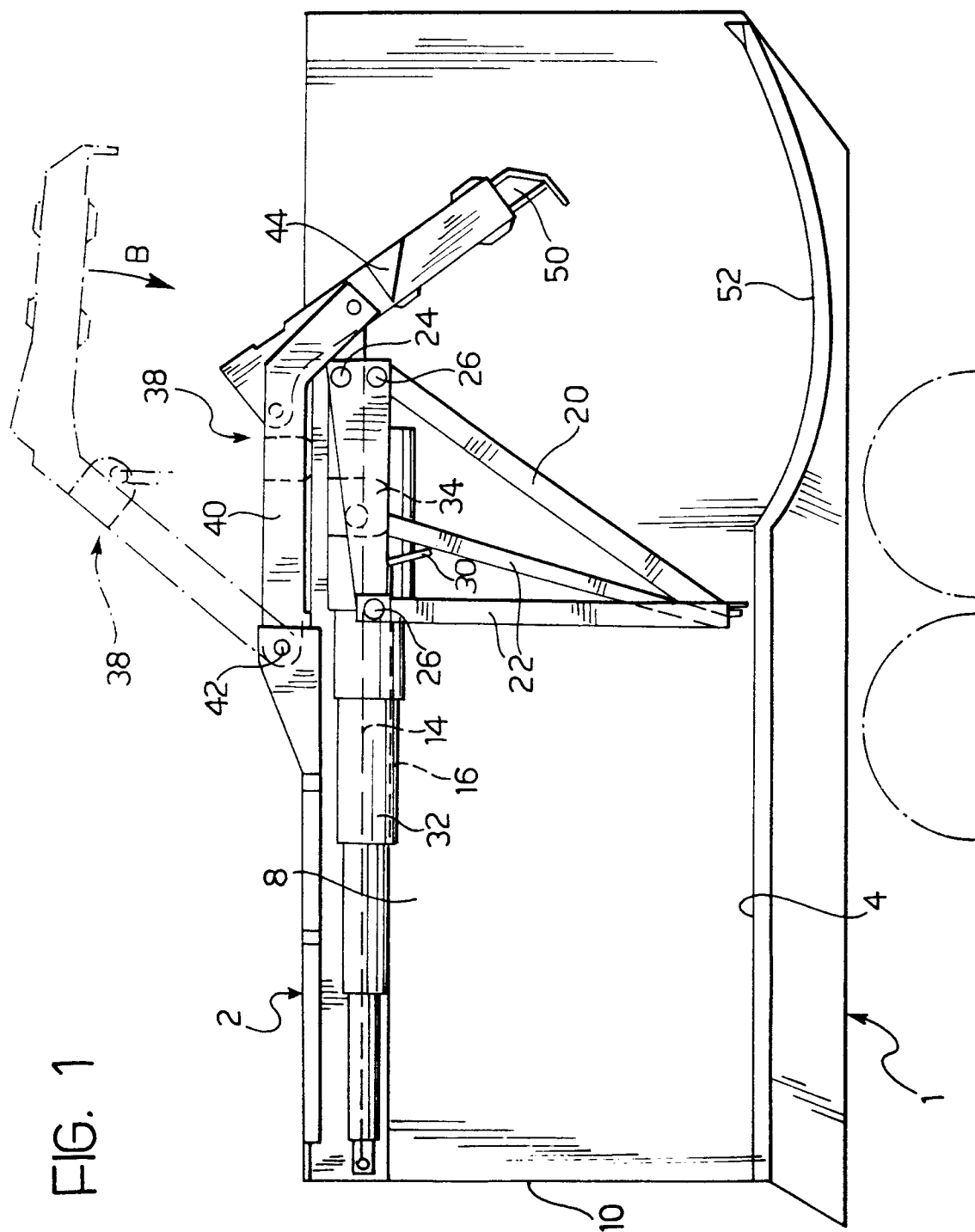
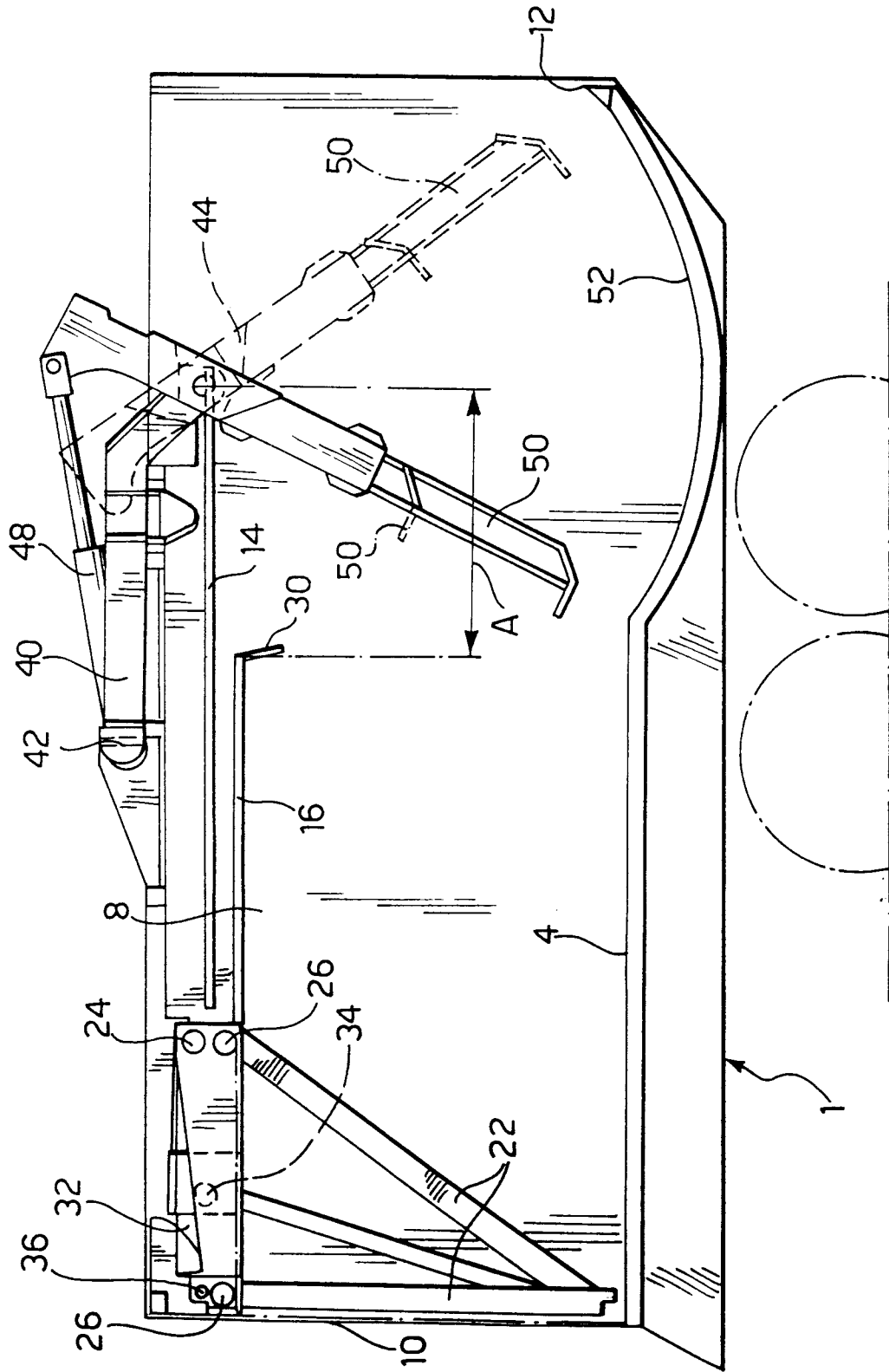


FIG. 2



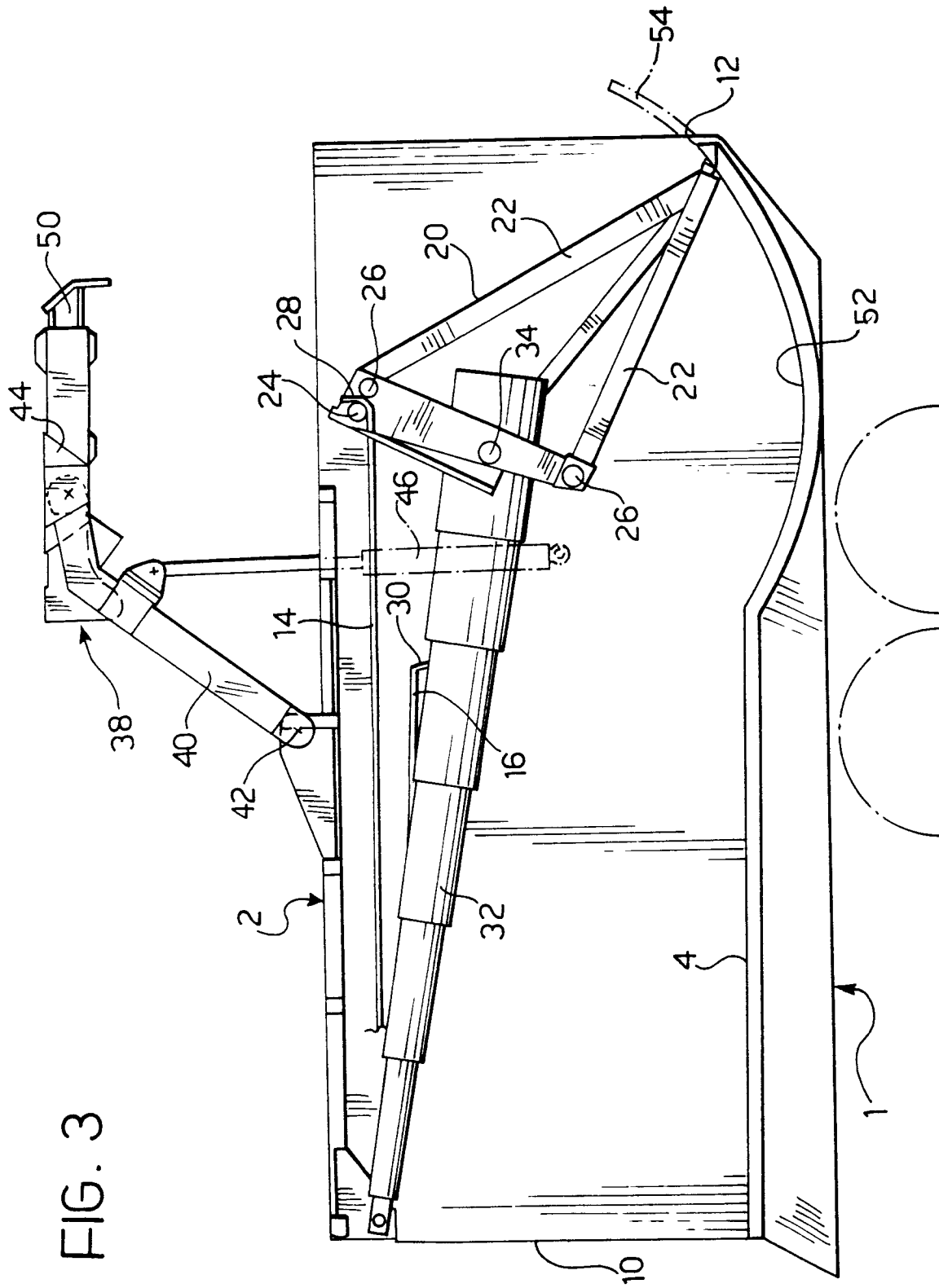


FIG. 3



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EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0218

DOCUMENTS CONSIDERED TO BE RELEVANT

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	NL-A-8 202 938 (FARID SPA) * page 4, line 32 - page 5, line 8; figures 4,5 * ---	1	B65F3/28
A	US-A-3 584 755 (SMITH) * column 3, line 9 - line 32; figures 1-3 * ---	1	TECHNICAL FIELDS SEARCHED (Int. Cl.5) B65F
A	US-A-3 690 480 (HEINE) * column 2, line 20 - line 32; figure * ---	1	
A	EP-A-0 387 616 (THE HEIL CO.) * column 4, line 23 - line 37; figures 3-5 * -----	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28 AUGUST 1992	Examiner MARTINEZ NAVAR
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