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(54) **Hand operated garbage press**

(57) A device for compressing refuse in a household refuse container. A first rod is connected to the wall in such a manner as to be capable of pivoting movement in a vertical plane. A second rod is connected to said

first rod with a first end, likewise in such a manner as to be capable of pivoting movement in a vertical plane. The cover is placed in a horizontal position by moving the first rod down, after which the refuse present in a household refuse container can be compressed.

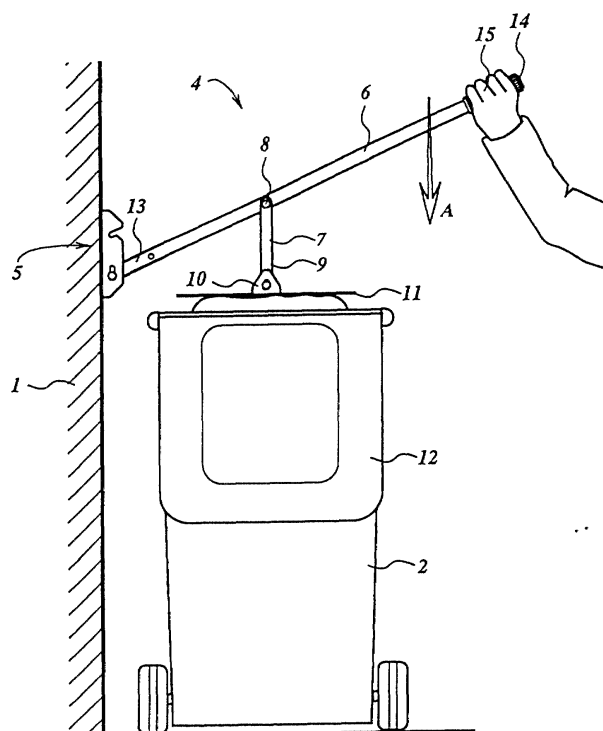


Fig. 2

Description

[0001] The invention relates to a device for compressing refuse in a household refuse container.

[0002] Household refuse containers are increasingly being used in many countries of the world for the temporary storage of household refuse, after which the containers can be emptied, for example into a refuse truck, by means of a mechanical device. The refuse can be deposited into the existing household refuse containers in the form of loose refuse, or be put in refuse bags first, after which the refuse bags are deposited into the household refuse container.

[0003] One drawback of this existing situation is the fact that, irrespective of the fact whether the refuse is deposited into the household refuse container in the form of loose refuse or in the form of full refuse bags, said refuse takes up more space in the household refuse container than is absolutely necessary. As a consequence, it frequently happens that the capacity of one household refuse container is not sufficient for a household, whilst there is no need to acquire a second household refuse container because of the fact that in many cases such an excess of refuse occurs only occasionally. On the other hand, refuse collecting services are generally not prepared to accept refuse that is not presented in the household refuse containers that are usually prescribed.

[0004] Devices for compressing refuse in a container are known per se. The containers in question are small containers having a height in the order of 30 - 50 cm and a diameter ranging between 15 cm and 25 cm, which are used indoors. Generally a plastic refuse bag is placed into such containers, which bag is removed once the container is full and subsequently deposited into a large household refuse container as described above, which is generally disposed outside in the open air.

[0005] Furthermore devices for compressing refuse in very large containers are known which are used by industries or by municipalities in the course of their ordinary business. Devices of this kind, which are called refuse collecting containers herein, often have large dimensions of as much as a few metres in all directions, in some case they are so large that they are disposed at a fixed location, or they have dimensions and a weight which just allow transport by medium-sized trucks. In these cases the compression devices in question are used for compacting the refuse that is present in the containers, which are several metres high, before it is carried off.

[0006] The object of the present invention is to provide a solution for the problems that a normal household experiences in filling a household refuse container of the kind that is used by households.

[0007] In order to accomplish that objective, a device according to the invention is characterized by fixing means for fixing the device to a wall, by a first rod which is pivotally connected to said fixing means with one end

and which, once it is fixed to the wall, pivots about a substantially horizontal axis, a second end of which first rod functions as a handle, by a second rod, which is pivotally connected to said first rod at a position between said first and said second end of the first rod, which second rod is pivotally connected to a cover near a lower end.

[0008] A device of this kind makes it possible to compress, by means of a few simple operations, refuse that has already been deposited in a household refuse container. Since the second rod is pivotally connected to the first rod at a position between the first and the second end of the first rod, the leverage thus obtained can be utilized advantageously. The force that is exerted on the second end of the first rod is multiplied as a result of said leverage, and it is exerted in multiplied form on the refuse that is present in the household refuse container. The device in question is of extremely simple construction and it can be permanently disposed at a desired location on a building.

[0009] One preferred embodiment of a device according to the invention is characterized in that the second rod includes a pin at its lower end, in that the pivoted joint of the lower end of the second rod is movably connected to the cover, in that said movement takes place in a direction substantially perpendicularly to the plane of the cover, in that movement is possible between a first position, in which the pin is passed through an opening which is fixed with respect to the cover, and a second position, in which the pin is not passed through said fixed opening.

[0010] The result that is obtained by the above features is that the position in which the deposited refuse is compressed by the cover in the household refuse container cannot change with respect to the second rod. The force of gravity and the fact that the second rod is pivotally connected to the first rod ensure that the second rod extends substantially straight down at all times. Another effect that is achieved thereby is that the cover will occupy a substantially horizontal position at all times during compression of the refuse that is present in the household refuse container, independently of the height of the deposited refuse in the household refuse container or the degree to which said refuse is compressed by a device according to the invention.

[0011] Another preferred embodiment of a device according to the invention is characterized in that means are present for maintaining the first rod in a substantially vertical position against the wall after the device has been fixed to the wall.

[0012] Thus the device according to the invention can be put away permanently in a manner which is safe and which requires little space, whilst the device is nevertheless ready for use at all times.

[0013] Another preferred embodiment of a device according to the invention is characterized in that said means for maintaining the first rod in a substantially vertical position against the wall comprise at least one plate

to be fixed to the wall, which plate includes a portion projecting from the wall, in that said projecting portion includes an open slot, which open slot extends a certain distance in the direction of the wall from an edge of the plate that faces away from the wall, in that said projecting portion includes a slotted hole, which slotted hole extends in at least vertical direction, after the device has been fixed to the wall, in that the pivoted joint of the first rod extends through the slotted hole in the fixing means whilst being movable therein, and in that a pin is attached to said first rod, which pin can move through the open slot upon pivoting movement of the first rod.

[0014] This arrangement makes it possible to move the rod to a position in which it extends at least substantially parallel to the wall.

[0015] Another preferred embodiment of a device according to the invention is characterized in that said open slot slopes downwards towards the wall once the plate is fixed to the wall.

[0016] As a result of this arrangement, the guidance of the pin in the open slot will cause the first end of the rod to move downwards through the slotted hole together with the pivoted joint when the first rod is moved towards the wall. Thus a large degree of stability and locking engagement is obtained, because forces resulting from the action of gravity will be exerted on the first rod, the second rod and the cover in vertically downward direction, which forces merely ensure that the pin is urged further into rather than out of the open slot.

[0017] Yet another preferred embodiment of a device according to the invention is characterized in that the first rod is fitted with a second handle between said first and said second end.

[0018] This arrangement makes it possible to use a long first rod, which can be placed vertically against the wall, whilst a handle is nevertheless provided within arm's reach, by means of which handle the first rod can be pulled down in order to use the device. A longer first rod has the advantage that an increased leverage is obtained: the longer the first rod the greater the leverage, the smaller the force to be exerted on the second end so as to have the cover exert a similar compressive force on the refuse that is present in the household refuse container.

[0019] The invention will now be explained in more detail with reference to the accompanying drawings, wherein:

Figure 1 shows a well-known household refuse container disposed beside a device according to the invention;

Figure 2 shows a device according to the invention in operation;

Figure 3 is a side view of a device according to the invention, which is fixed to a wall of a building;

Figure 3A is a cross-sectional view along line IIIA-III A in Figure 3;

Figure 4 shows a first rod;

Figure 5A shows the manner in which the second rod and the cover co-operate to maintain the cover in a horizontal position upon compression of the refuse;

Figure 5B is a view along line VB-VB in Figure 5A; Figure 6A shows how the cover reaches a freely pivotable position after the compression of the refuse has been stopped;

Figure 6B is a view along line VIB-VIB in Figure 6A; Figure 7A is a side view of a part of a device according to the invention, wherein the device is shown in an inoperative position thereof;

Figure 7B is a view corresponding to Figure 7A, wherein the device is shown in an operative position thereof;

Figure 8 is a top plan view of a part of a device according to the invention;

Figure 9 shows an alternative embodiment of the fixation of a device according to the invention to a house; and

Figures 10, 11 and 12 show alternative embodiments for a part of a device according to the invention.

[0020] In Figure 1, numeral 1 indicates a wall of a building. A household refuse container 2 is present on the ground 3 beside wall 1. A compression device 4 according to the invention is fixed to wall 1. Compression device 4 comprises fixing means 5 for fixing the device 4 to wall 1, a first rod 6, a second rod 7, which is pivotally connected to first rod 6 via a joint 8. A cover 11 is pivotally connected to second rod 7, by means of a joint 10, at a lower end 9 of second rod 7. Household refuse container 2 has a cover 12 that can be swung to an open position. Usual household refuse containers 2 have a height varying between 1.10 m and 1.60 m. Accordingly, the compression device 4 with the fixing means 5 must be fixed to the wall 1 at a height that corresponds to the height of the container in which the refuse is to be compressed.

[0021] Rod 6 is pivotally connected to the fixing means 5 with a first end 13. A second end 14 of rod 6 functions as a handle. An operator (not shown) can exert a force on the end 14 of rod 6 in the direction indicated by arrow A with his hand 15. Since rod 6 pivots about the pivoted joint to the fixing means 5, the force that is exerted on rod 7 by means of rod 6, likewise in the direction indicated by arrow A, is larger by a factor than the force that is exerted on end 14 by hand 15. The ratio between the forces is equal to the ratio of the distance from end 14 to end 13 of rod 6 to the distance from pivoted joint 8 to the end 13 of rod 6. Thus the force exerted by the person with his hand 15 can be doubled or tripled in a simple manner. The force that is exerted on rod 7 by first rod 6 is further transmitted via rod 7 to the cover 11 that rests on top of the refuse that is present in household refuse container 2. As a result, the refuse that is present in household refuse container 2 will be com-

pressed. In those cases where an extra long rod 6 is used, it is often no longer possible to reach handle 29. In that case first rod 6 may be fitted with a handle 64 as illustrated in a dotted line in Figure 1.

[0022] Figure 3 shows how first rod 1 can be placed flat against wall 1. A magnet 16 is fixed to wall 1 in Figure 3. Figure 3 furthermore shows a clamping ring, which is fixed to wall 1 by means of a well-known fastening member 18 (not further specified). According to a first method of maintaining first rod 6 in a substantially vertical position against the wall, a magnet 16 is used in those cases wherein first rod 6 is made of a magnetic material.

[0023] In cases wherein first rod 6 is not made of a magnetic material, or a magnet 16 is not available, a clamping ring 17 may be used, which clamping ring is fixed to wall 1 by means of a fastening member 18.

[0024] According to a third method of maintaining first rod 6 in a substantially vertical position against the wall, a pin 19, an open slot 20, a slotted hole 21 and a plate 22 are used, which are all shown in Figure 3 and which will be discussed in more detail in the discussion of Figures 7A and 7B.

[0025] Figure 4 shows the first rod 6 in more detail. First rod 6 includes an opening 23 near a first end 13, through which a bolt 24 extends. First rod 6 furthermore includes two pins 25 and 26, which may also form the two ends of a long pin that is passed through a hole 27, as indicated by a dashed line. Rod 6 furthermore includes an opening 28, which forms part of the pivoted joint 8. A handle 29 is present at second end 14.

[0026] Figure 5A is a more detailed view of the second rod 7 and of the co-operation of second rod 7 with first rod 6 and cover 11.

[0027] Second rod 7 consists of two parallel rods 7a and 7b, which are interconnected near lower end 9 by means of a connecting piece 37. Connecting piece 37 is hollow. A pin 32 is attached to connecting piece 37. Rods 7a and 7b are attached to first rod 6 by means of a bolt and nut connection (schematically indicated at 36), whereby said bolt is passed through opening 28 in first rod 6. A U-shaped angle iron 30 is fixed to cover 11. An opening 31 is formed in the bottom of said U, which opening is sufficiently large to allow pin 32 to pass therethrough. Angle iron 30 is fixed to cover 11. Also cover 11 includes an opening 38, which, like opening 31, is sufficiently large to allow pin 32 to pass therethrough. The upright parts of angle iron 30 include slotted holes 33a and 33b. A bolt 34 is passed through slotted holes 33a and 33b as well as through connecting piece 37, which bolt is secured by means of a nut 35. In this manner the connecting rod 7a, 7b is connected to angle iron 30 and cover 11. The securing of nut 35 to bolt 34 takes place in such a manner that free movement of bolt 34 through slotted holes 33a and 33b remains possible.

[0028] When first rod 6 is pulled down by handle 29, first rod 6 moves in the direction indicated by arrow B. During said downward movement, cover 11 comes into contact at some point with the refuse that has been de-

posited in household refuse container 2, which refuse is schematically indicated at 39. As a result of said coming into contact, refuse 39 exerts a force on cover 11 in the direction indicated by arrow C. Since the bolt and nut connection 34, 35 allows movement of bolt 34 through slotted holes 33a and 33b, the pivoted joint made up of bolt 34 and nut 35 is positioned at the very bottom of slotted holes 33a and 33b, owing to the force that is exerted on cover 11 in the direction indicated by arrow C. As a consequence, pin 32 is inserted at least in opening 31 of the U-shaped angle iron, and preferably also in the opening 38 in cover 11. It will be apparent that free pivoting movement of cover 11 about the pivoted joint 34, 35 is not possible as long as pin 32 is inserted in openings 31 and 38. The position of cover 11 with respect to second rod 7a, 7b is thus fixed and cannot change. During the downward movement of first rod 6 in the direction indicated by arrow B, second rod 7a, 7b and cover 11 were subjected to the force of gravity. As a consequence, second rod 7a, 7b extended substantially straight down. As a result of this, cover 11 has taken up a horizontal position, which horizontal position cannot change any more once cover 11 has come into contact with the deposited refuse 39, due to said fixation by means of pin 32 in openings 31 and 38.

[0029] Figures 6A and 6B show the situation that presents itself when first rod 6 is moved up in the direction indicated by arrow C. Cover 11 is no longer in contact with the refuse 39 present in household refuse container 2, and as a consequence there is no longer exerted a force on cover 11 in the direction indicated by arrow C (see Figure 5A). Consequently, the pivoted joint 34, 35 will move upwards with respect to slotted holes 33a and 33b, that is, cover 11 will hang down in slotted holes 33a and 33b from the pivoted joint 34, 35. In this situation the pin 32 no longer extends into openings 31 and 38. As a consequence, the cover 11 can freely pivot to and fro about an axis extending through pivoted joint 34, 35. Finally, when first rod 6 has reached a substantially vertical position, cover 11 will take up a position as shown in Figure 1.

[0030] In Figure 7A the pivoted connection of the first rod to the fixing means 5 and the attachment of the fixing means 5 to wall 1 is shown in more detail. With reference to Figures 7A, 7B and 8, a U-shaped angle iron 39 is fixed to wall 1 by means of screws 43 and 44. Angle iron 39 has two upright portions 22 and 40 that project from the wall. A slot 20 is formed at least in projecting portion 22. Preferably, but not necessarily, a similar slot is formed in projecting portion 40. In case projecting portion 40 does not include a slot, said projecting portion 40 is illustrated in a chain-dotted line in Figures 7A and 7B. Projecting portions 22 and 40 furthermore include slotted holes 21 and 47. Slot 20 extends downwards in the direction of wall 1, and terminates in a rounded portion 46. Due to the fact that slot 20 slopes downwards, a bump 45 is automatically formed. The distance between pin 25 and pivot 24 equals the distance from the

centre of rounded portion 46 to the centre of the lower rounded portion of slotted hole 21. Pivot 24 is provided with screw thread at the ends, and it is movably attached in slotted holes 21 and 47 in angle iron 39 by means of nuts 41 and 42. First rod 6 is capable of pivoting movement about pivot 24. Figure 7A shows the situation wherein first rod 6 is maintained in a substantially vertical position against the wall in an position of rest. Pivot 24 is positioned at the bottom of slotted holes 21 and 47 in that position. Pin 25 and, if present, pin 26 are positioned in rounded portion 46. Since the force of gravity acts in the direction indicated by arrow E, and bump 45 exhibits an upward slope, first rod 6 occupies a stable position. Rod 6 can only be removed from said stable position by exerting a force at least in the direction indicated by arrow F, as a result of which pin 25 can move over bump 45, with pivot 24 at the same time moving upwards in slotted holes 21 and 47. When first rod 6 is put away, that is, moved to a substantially vertical position against the wall, the reverse procedure is followed, and a force is exerted on rod 6 in a direction opposed to the direction indicated by arrow F in order to enable pin 25 to move over bump 45, with pivot 24 at the same time moving upwards in slotted holes 21 and 47. Then the first rod 6 moves down from bump 45 into rounded portion 46, whilst pivot 24 moves into slotted holes 21 and 47 simultaneously therewith.

[0031] Figure 9 shows an alternative to the U-shaped angle iron 39. Oblique angle irons 53 and 54 are fixed on both sides of a corner 50 between walls 51 and 52. Oblique angle irons 53 and 54 include portions 55 and 56 projecting from the wall. Projecting portions 55 and 56 are formed in the same manner and include the same open slots and slotted holes as the angle iron 39 that has been discussed with reference to Figures 7A, 7B and 8. The advantage of this arrangement is that in this situation more space is available for walking past the household refuse container, which is disposed beside the device for the purpose of compressing the refuse present therein, than is the case in the situation as shown in Figures 1 and 2. Furthermore there is a possibility that the space which is available between either one of said walls 51 and 52 and obstructions present outside said walls, such as walls of other houses, is too small to dispose the compression device 4 at that location.

[0032] Figure 10 shows an alternative embodiment of the construction that is shown in Figures 6A and 6B. In Figure 10 a tee piece 57 is mounted on cover 11. Tee piece 57 and cover 11 are both provided with the openings 31 and 38 that have already been discussed with reference to Figures 6A and 6B, through which openings a pin 32 of second rod 7 can be passed. Second rod 7 pivots about a pin 59. Pin 59 can move to and fro in the direction indicated by arrow G through a slotted hole 58 in the leg of tee piece 57. The operation of this embodiment is entirely analogous to the operation that has been discussed with reference to Figures 6A and 6B,

and consequently it will not be discussed anew.

[0033] Figure 11 shows a second alternative embodiment for the connection between second rod 7 and cover 11. Rod 7 is a single rod in this embodiment, which bifurcates near lower end 9 into a fork having teeth 60 and 61. Mounted on cover 11 is a tee piece 57 having a slotted hole 58 in the leg of the tee, as well as an opening 31 which coincides with an opening 38 in cover 38. Leg 60 includes a pin 32, which is aligned with openings 31 and 38. Disposed between legs 60 and 61 is a connecting piece 62, which can move upwards and downwards through slotted hole 58 in the direction indicated by arrow G. Also in this case the operation of the device as shown in Figure 11 is analogous to the operation of the device as shown in Figures 6A and 6B, and consequently it will not be discussed anew.

[0034] In all the preceding embodiments pin 32 is passed through an opening 38 in cover 11. Figure 12 shows an alternative embodiment, which includes a cylinder 62 for receiving pin 32, in which cylinder an opening 63 is formed which is suitably shaped for receiving pin 32.

[0035] Many embodiments of a compression device according to the invention will be obvious to a person skilled in the art who has studied the foregoing. All such embodiments are considered to fall within the scope of the following claims.

Claims

1. A device for compressing refuse in a household refuse container, characterized by fixing means for fixing the device to a wall, by a first rod which is pivotally connected to said fixing means with one end and which, once it is fixed to the wall, pivots about a substantially horizontal axis, a second end of which first rod functions as a handle, by a second rod, which is pivotally connected to said first rod at a position between said first and said second end of the first rod, which second rod is pivotally connected to a cover near a lower end.
2. A device according to claim 1, characterized in that the second rod includes a pin at its lower end, in that the pivoted joint of the lower end of the second rod is movably connected to the cover, in that said movement takes place in a direction substantially perpendicularly to the plane of the cover, in that a movement is possible between a first position, in which the pin is passed through an opening which is fixed with respect to the cover, and a second position, in which the pin is not passed through said fixed opening.
3. A device according to claim 1 or 2, characterized in that means are present for maintaining the first rod in a substantially vertical position against the wall

after the device has been fixed to the wall.

4. A device according to claim 3, characterized in that said means for maintaining the first rod in a substantially vertical position against the wall comprise at least one plate to be fixed to the wall, which plate includes a portion projecting from the wall, in that said projecting portion includes an open slot, which open slot extends a certain distance in the direction of the wall from an edge of the plate that faces away from the wall, in that said projecting portion includes a slotted hole, which slotted hole extends in at least vertical direction, after the device has been fixed to the wall, in that the pivoted joint of the first rod extends through the slotted hole in the fixing means whilst being movable therein, and in that a pin is attached to said first rod, which pin can move through the open slot upon pivoting movement of the first rod.
5. A device according to claim 3, characterized in that said means for maintaining the first rod in a substantially vertical position against the wall comprise a magnetic attraction device for the rod, which can be fixed to the wall.
6. A device according to claim 4, characterized in that said open slot slopes downwards towards the wall once the plate is fixed to the wall.
7. A device according to claim 3, characterized in that said means for maintaining the first rod in a substantially vertical position against the wall comprise a clamping device for the rod, which can be fixed to the wall.
8. A device according to any one of the preceding claims, characterized in that said first rod is fitted with a second handle between said first and said second end.
9. A device according to any one of the preceding claims, characterized in that the distance along the first rod between the pivoted connection to the fixing means and the position located between said first and said second end is larger than the distance along the second rod between the lower end and the pivoted connection to the first rod.

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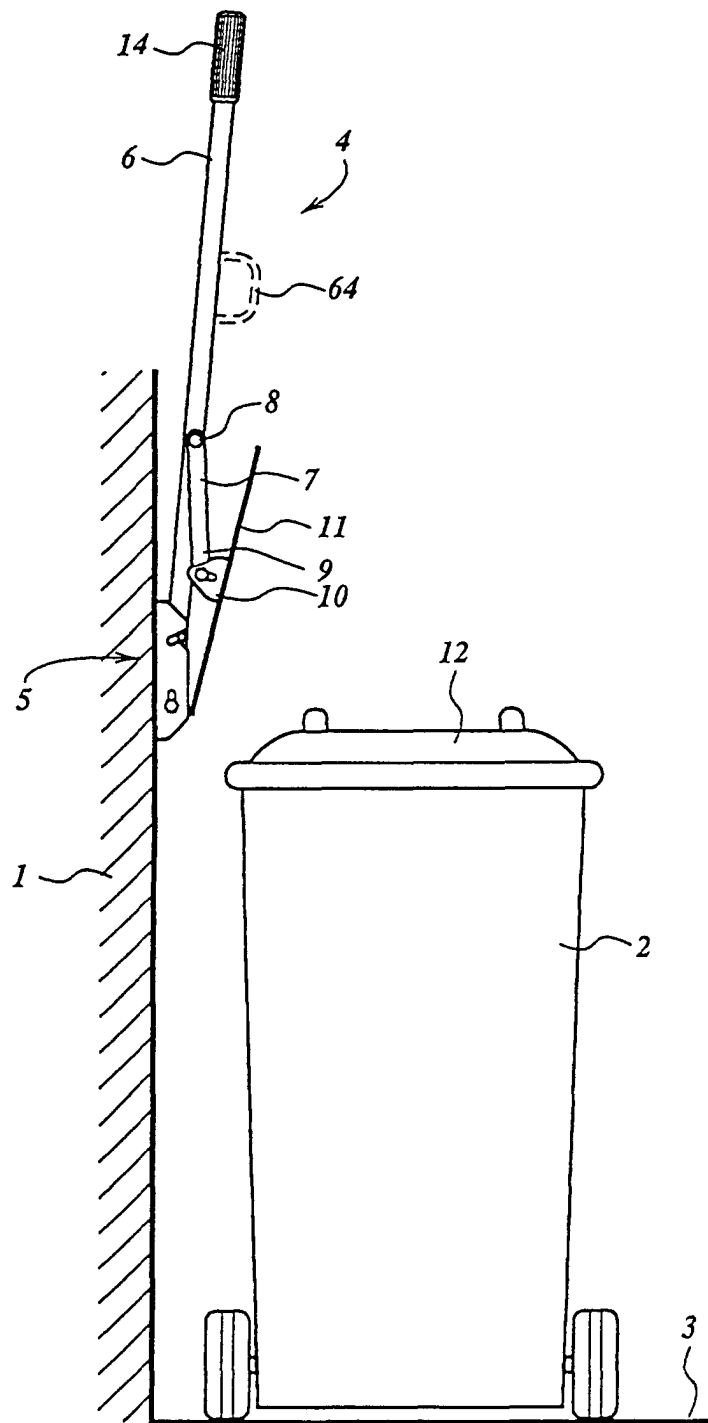


Fig. 1

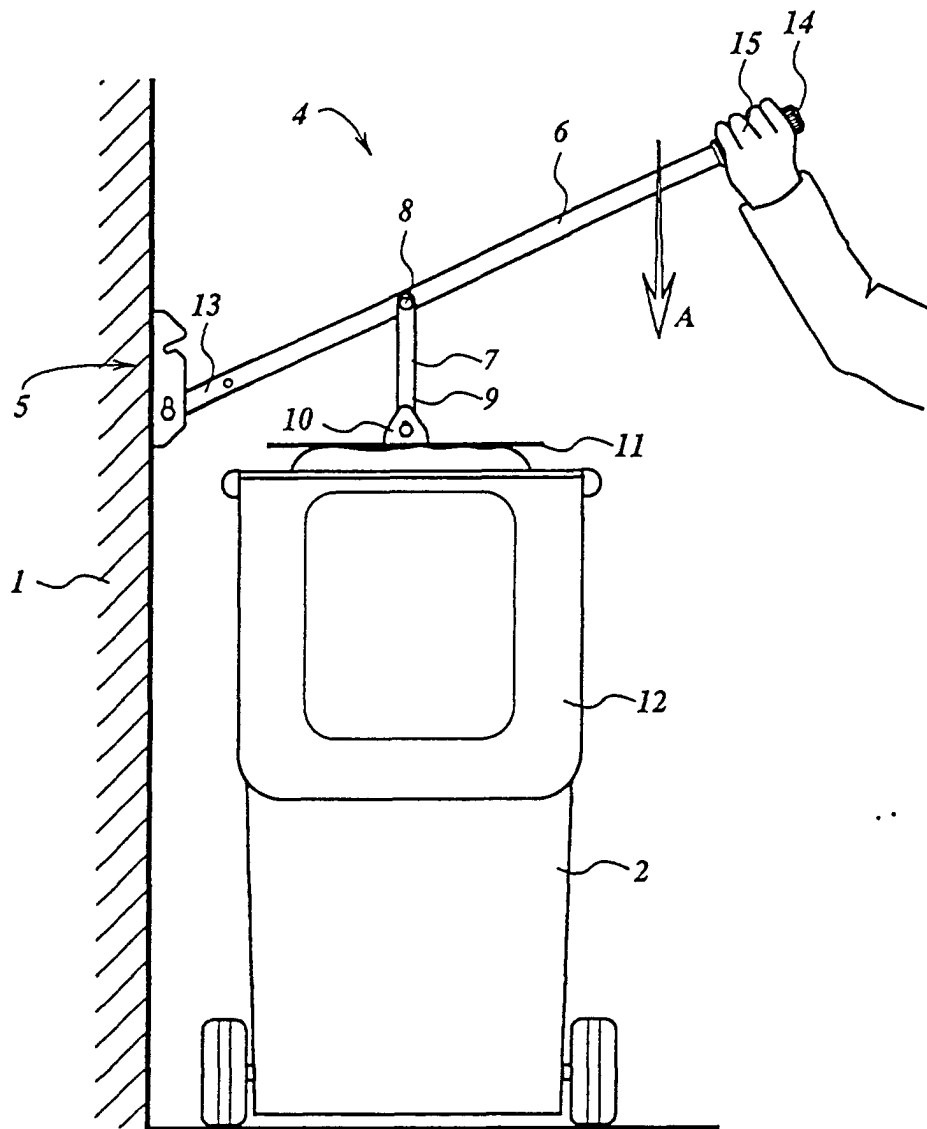


Fig. 2

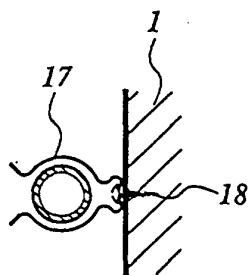


Fig. 3A

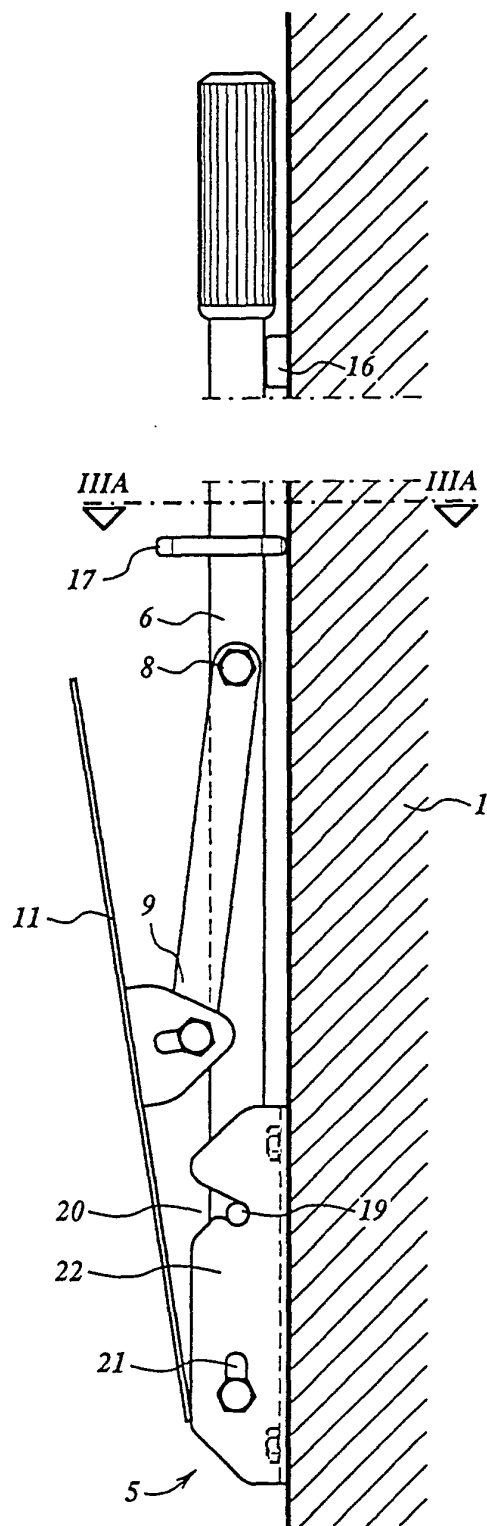


Fig. 3

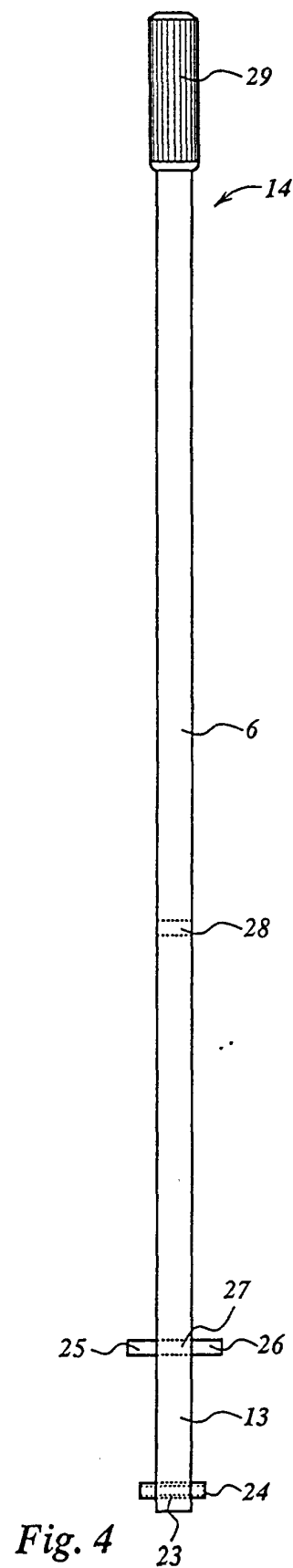


Fig. 4

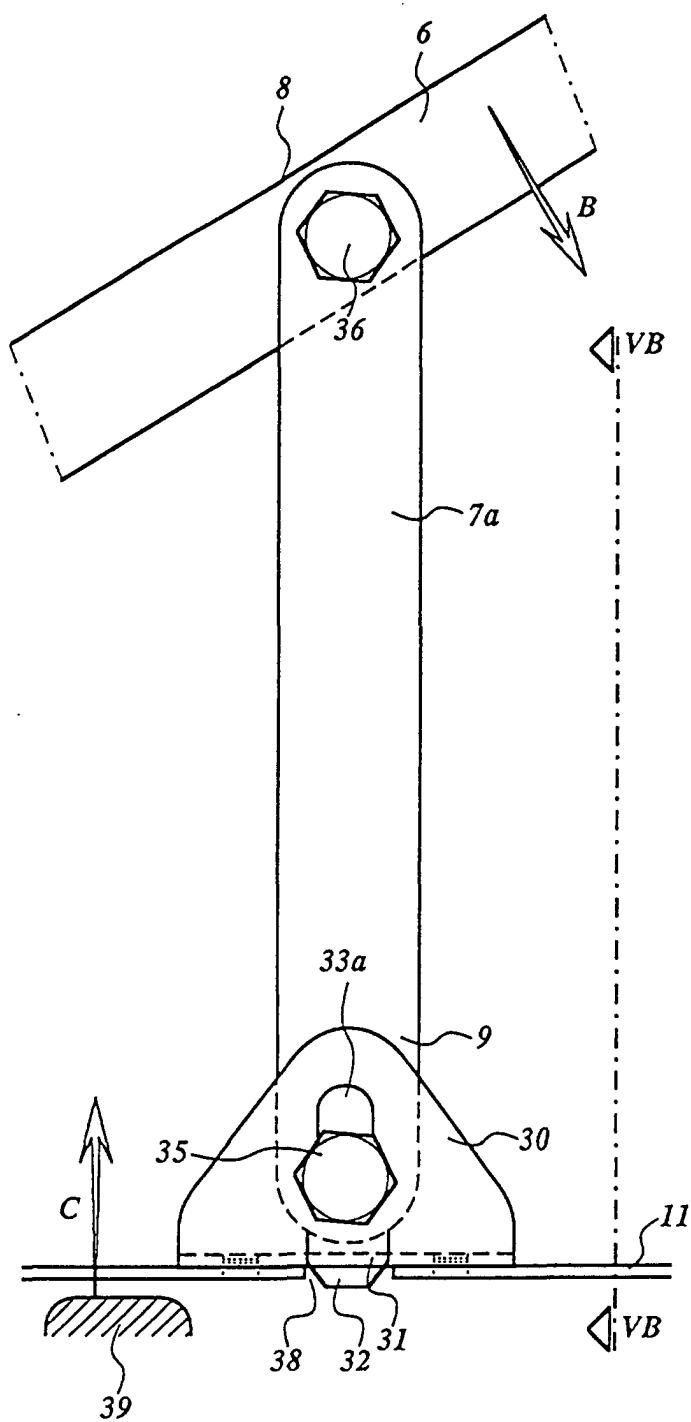


Fig. 5A

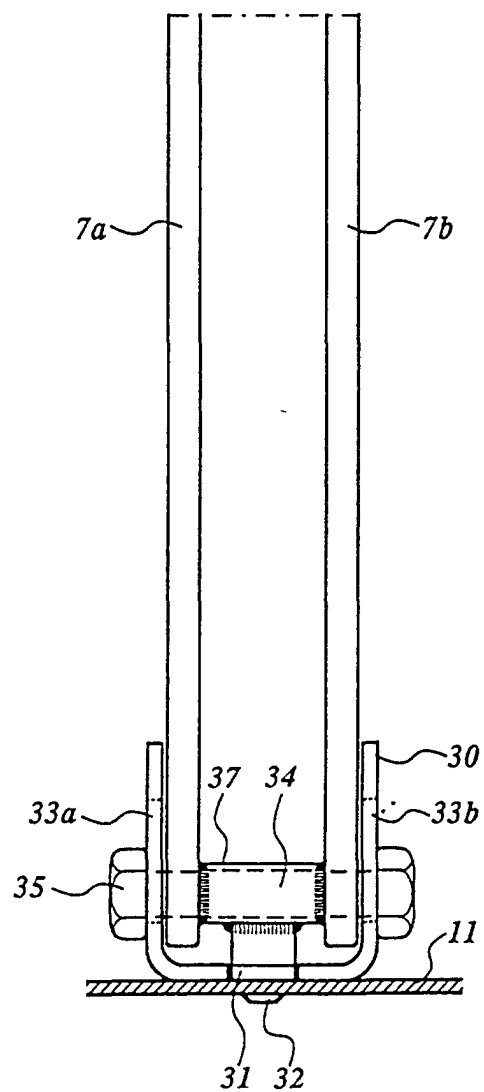


Fig. 5B

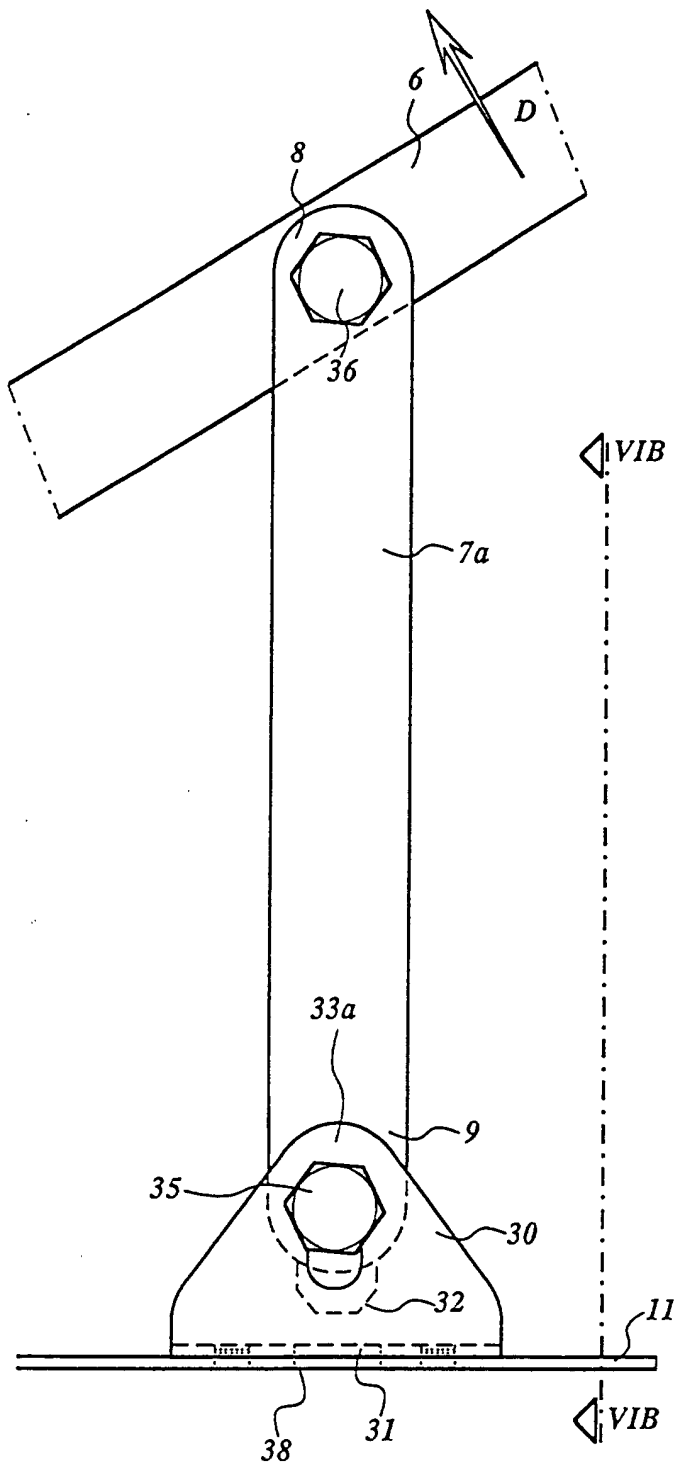


Fig. 6A

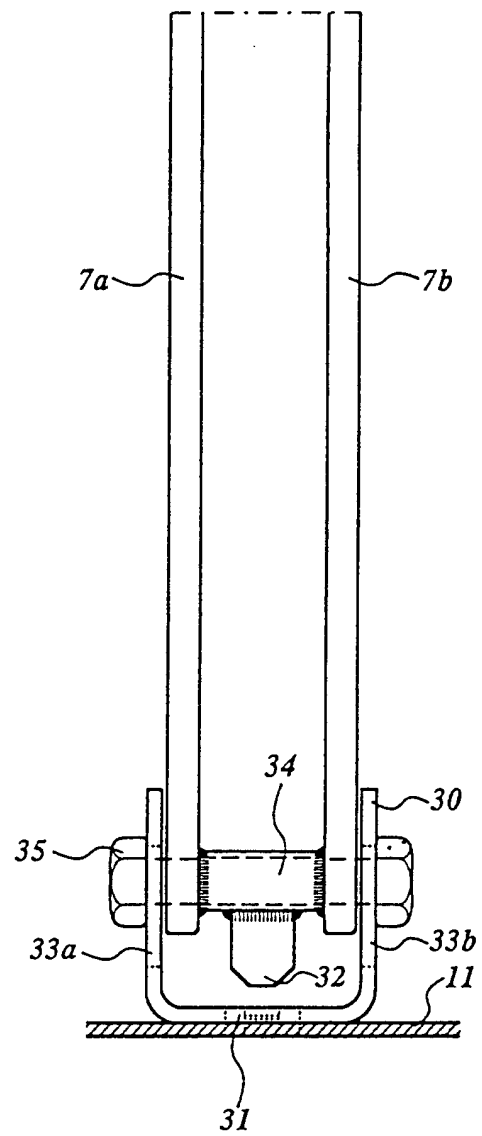


Fig. 6B

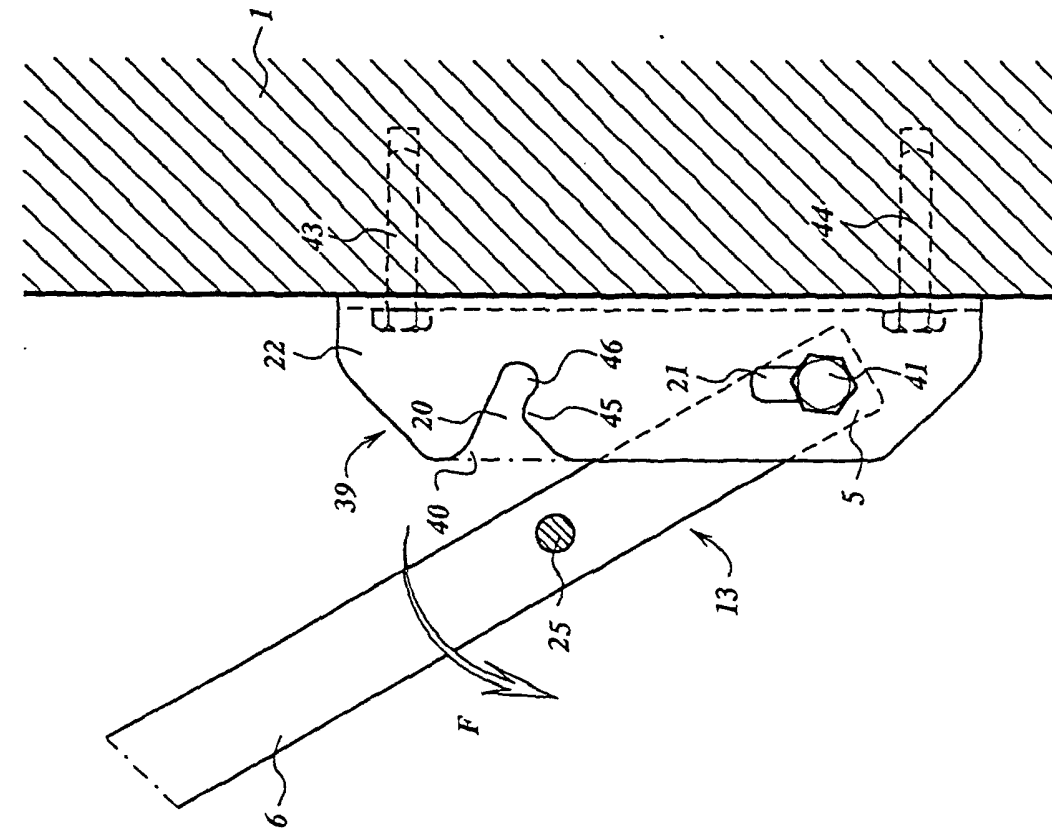


Fig. 7a

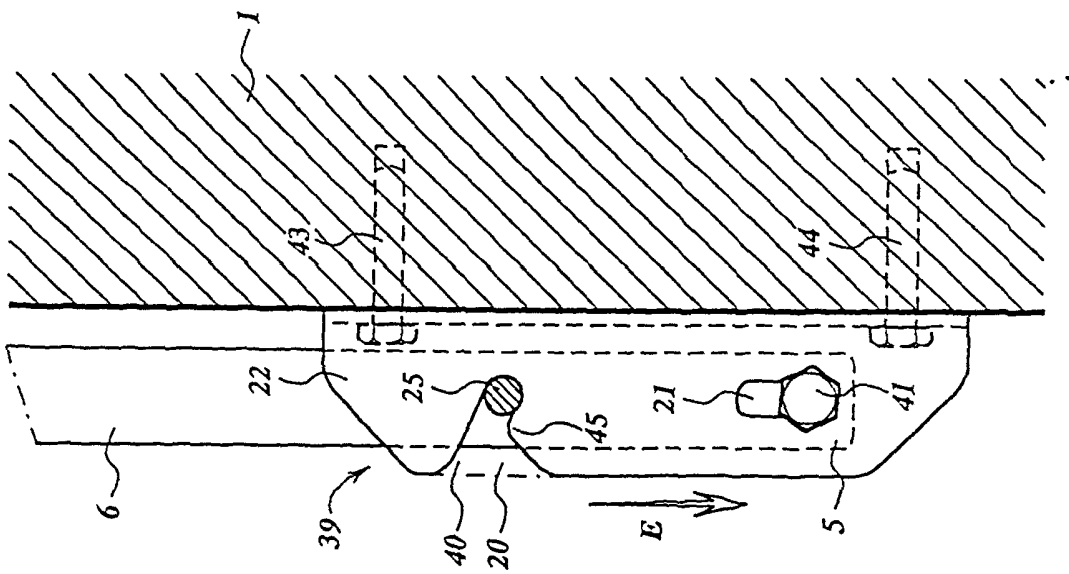


Fig. 7b

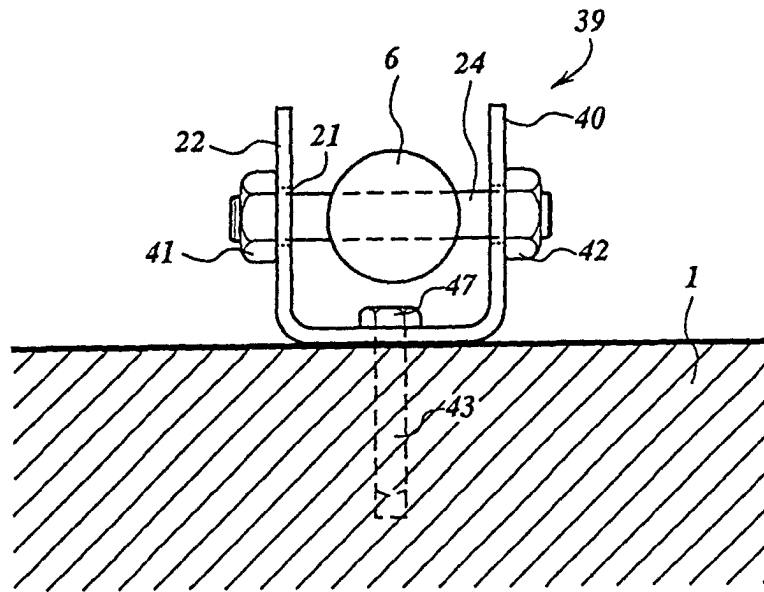


Fig. 8

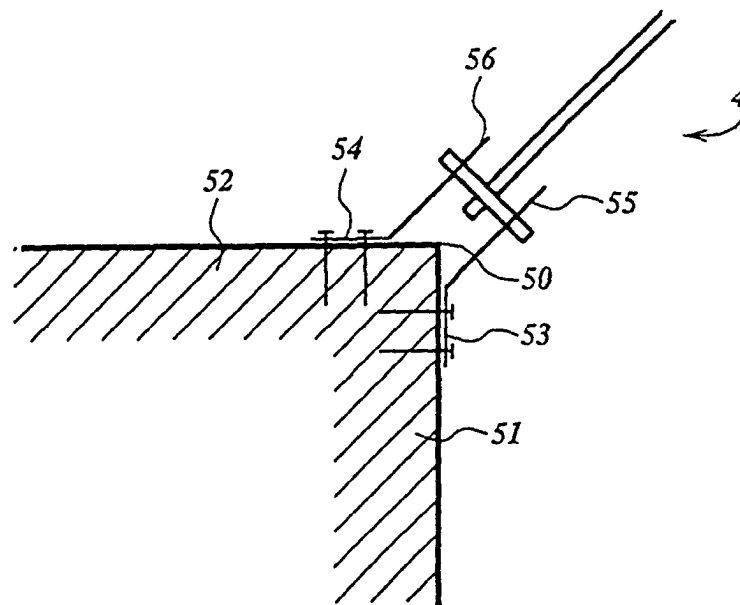


Fig. 9

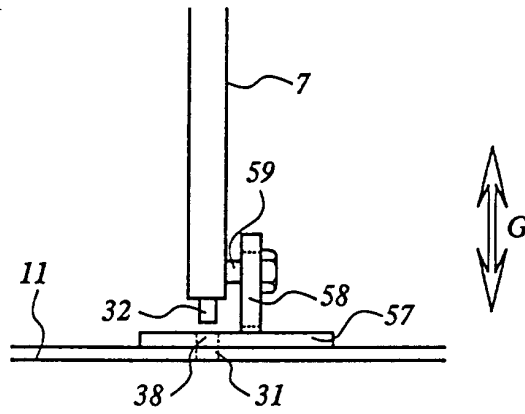


Fig. 10

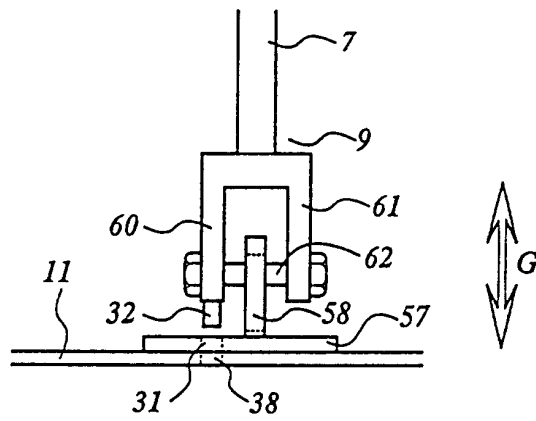


Fig. 11

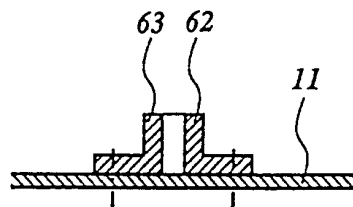


Fig. 12



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 20 0090

DOCUMENTS CONSIDERED TO BE RELEVANT			
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X	US 3 919 932 A (BASUINO ANTONIO F) 18 November 1975 (1975-11-18)	1,3,8,9	B65F1/14
Y	* column 3, line 4 - line 13; figures 1-3 *	2	
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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 12 June 2001	Examiner Müller, C
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			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 20 0090

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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12-06-2001

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