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(54) Vending machine for solid and liquid products

(57) A vending machine for solid and liquid products is described, which comprises a cabinet-type structure inside which a solid products vending apparatus and a liquid products vending apparatus are installed one on the top of the other: the delivery doors of the products delivered by the liquid products vending apparatus and by the solid products vending apparatus are positioned side-by-side on the cabinet's front panel at the same height from the ground.

The vending machine further comprises lifting means suitable to lift the product delivered by the down-placed vending apparatus at the relevant delivery door.

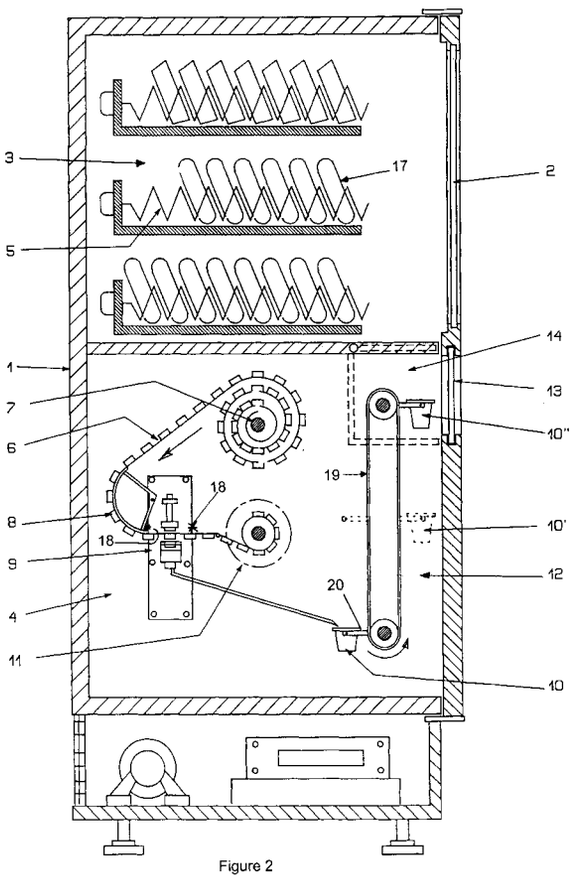


Figure 2

EP 1 063 621 A1

Description

Field of the invention

[0001] This invention relates to a vending machine for solid products such as snacks, pastries, sandwiches, other foods, fruit juice or drinks packed in cans and so on as well as for liquid products in cups such as coffee, tea and other types of infusion.

State of the art

[0002] The so-called vending machines of solid products and of hot and cold liquid products to be installed in schools, hospitals, factories, stations, airports and similar locations where there is the need for a quick snack are already well-known.

[0003] These vending machines generally have a metal cabinet-type structure representing the casing of the machine inside which vending apparatuses for solid or liquid products are positioned, which are activated when the purchasing price of the product to be retrieved (selected by the user through an appropriately positioned push-button panel) has been cashed by inserting coins or tokens into a slot on the front panel and/or a bank note into a bank note reading device and/or a magnetic card on a suitable decoder and/or through another already known cashing device.

[0004] Up to now, vending machines designed to sell at least two different types of product, i.e. a solid product such as a snack and a liquid product such as coffee, have been realised by bringing together two distinct vending machines, each with its own delivery door which the user must open in order to retrieve the preselected product.

[0005] These two vending machines, both with different construction characteristics, are generally placed one on top of the other, for example with the liquid product vending machine in the upper position and the solid product vending machine underneath.

[0006] This type of positioning, which is quite necessary to limit to a minimum the surface area of the vending machine, involves that the two products are delivered by doors positioned on the front panel at different heights: at least one of the doors is situated in a very low position rendering difficult the retrieval operation by the user.

[0007] The present invention overcomes said drawbacks as it refers to a vending machine for solid products (snacks, pastries and so on) and for liquid products in cups (coffee, tea and so on, served hot if required) positioned one on the top of each other, where the delivery doors of the said products are positioned side-by-side at on the same height from the ground to be easily accessible by the user, rendering therefore the retrieval operation extremely simple.

[0008] On a preferred embodiment the vending machine to which this invention refer includes a solid product vending unit, of the spiral type for example, situated in the upper part, and a liquid product vending unit situated underneath.

[0009] Another feature of the invention is a special and innovative structure of a hot drink vending machine where the single portions of product (in powder, granules or leaves) to be infused for obtaining the hot drink are allocated on a continuous strip wound onto a reel and lifting means for lifting the cup containing the hot drink from a lower position to the delivery door situated at a higher level at approximately the half-way point of the cabinet's front panel are also provided.

Summary of the invention.

[0010] The present invention refers to a vending machine for solid and liquid products, comprising a cabinet-type structure inside which a solid products vending apparatus and a liquid products vending apparatus are installed one on the top of the other, where the delivery doors of the products delivered by the liquid products vending apparatus and by the solid products vending apparatus are positioned side-by-side on the same height from the ground, arranged approximately in line with the half-way point of the cabinet's front panel.

[0011] The vending machine comprises lifting means suitable to lift the product delivered by the down-placed vending apparatus at the relevant delivery door.

List of the drawings.

[0012] These and other features of the invention will be better disclosed with reference to the not-limiting embodiment shown by the enclosed drawings, where:

- figure 1 shows a front view of a vending machine according to the invention;
- figure 2 shows a sectional elevation view of a vending machine according to the invention;
- figure 3 shows a sectional front view of a vending machine according to the invention;
- figure 4 shows a front view of an embodiment of the lifting means of figure 3;
- figure 5 shows a side view of the lifting means of figure 4;
- figure 6 shows a portion of a continuos strip where a plurality of single portions of the product to be infused by the liquid products vending apparatus are allocated.

Detailed description.

[0013] The present invention refers to a vending machine for solid and liquid products, comprising a cabinet-type structure inside which a solid products vending apparatus and a liquid products vending apparatus are installed one on the top of the other, where the delivery door of the liquid products and that of the solid products

are positioned side-by-side on the cabinet's front panel at the same height from the ground, arranged approximately in line with the half-way point of the cabinet's front panel.

[0014] A characterising feature of said vending machine is that it comprises lifting means (figures 2 and 3) suitable to lift the product delivered by the down-placed vending apparatus at the relevant delivery door.

[0015] As shown by the front view of figure 1, a vending machine according to the present invention comprises a cabinet-type structure 1 whose front panel 14 provides for at least one delivery door 15 for solid products, for at least one delivery door 13 for liquid products and for a selection and cashing panel 16, not disclosed therein as it is known to any person skilled in the art and in any case it is outside the scope of the present invention.

[0016] On the preferred embodiment shown by figure 1, the front panel 14 of the vending machine 1 provides for a delivery door 13 for liquid products, for a pair of delivery doors 15 for solid products, positioned on the sides of the delivery door 13, and for transparent zone 2 belonging to the solid product vending unit 3 positioned in the upper part of the vending machine 1 but, without departing from the scope of the invention, a different number of delivery doors (13, 15) could be provided and/or the solid product vending unit 3 could be positioned in the lower part of the vending machine 1.

[0017] As shown by the sectional elevation view of figure 2, inside the cabinet-type structure 1 there are a solid products vending apparatus 3, positioned in the upper part of the cabinet-type structure 1, and a liquid products vending apparatus 4, positioned in the lower part of the cabinet-type structure 1 under the solid products vending apparatus 3.

[0018] Both the solid products vending apparatus 3 and the liquid products vending apparatus 4 are controlled by a commonly used control unit 3 driven by the user through the keyboard of the selection and cashing panel 16 (figure 1) and omitted on the enclosed drawings to simplify the graphical representation.

[0019] The solid products vending apparatus 3 uses an already known spiral system 5 to distribute the solid products 17, which are dispensed by the rotation of the spiral system 5 and drop in "pockets" (already known to any person skilled in the art and not shown in the drawings to simplify the graphical representation) positioned behind the delivery doors 15 for solid products (figure 1).

[0020] The liquid products vending apparatus 4 includes at least an infusion machine 9 (not disclosed therein as it is known to any person skilled in the art) supplied by a continuous strip 6, wound onto a first reel 7, into which are inserted in "blister" wrappings 8 single portions of products for infusion (coffee, tea, etc.) used by the infusion machine(s) 9 to realise the liquid product (s) collected in a known manner in a glass.

[0021] When a "blister" wrapping 8 is empty, it is removed from the infusion machine 9 by a rotation of a second reel 11 which rewinds a portion of the continuous strip 6, whose length is corresponding to the "step" between two adjacent "blister" wrappings 8.

[0022] A pair of sprocket wheels 18, positioned at the opposite sides of the infusion machine 9, are engaged on two series of holes 21 (figure 6b), positioned on the longitudinal edges of the continuous strip 6, whose "step" is corresponding to that between two adjacent "blister" wrappings 8 (or, at least, rigidly related thereto): the sprocket wheels 18 controls the rotation of the second reel 11 and stretch the portion of continuous strip 6 positioned inside the infusion machine 9 to help the removal of the empty "blister" wrapping 8 from the infusion machine 9.

[0023] The product for infusion (coffee, tea, etc.) could be in powder, in granules, in leaves or in any other form suitable for infusion.

[0024] Empty glasses are supplied by glasses stockage means belonging to the liquid products vending apparatus 4 and not disclosed therein as they are known to any person skilled in the art.

[0025] Lifting means 12 lift the filled glass from its lower position 10 to its upper position 10", inside the "pocket" 14 positioned behind the delivery door 13 for liquid products (figure 1).

[0026] Lifting means 12 comprise an endless chain (or belt) 19 moved in a known way by an electric motor (or by another moving means, functionally equivalent to the electric motor and not disclosed as it is know to any person skilled in the art) and provided with at least one grasp means 20 (for example a fork-shaped body connected to a support integral to the endless chain 19 through coupling pins) coplanar to the plane defined by the endless chain 19 and suitable to receive the glass to be filled at its lower position 10; when the glass is filled, the endless chain 19 is moved by the electric motor to lift the glass to its upper position 10" inside the "pocket" 14 positioned behind the delivery door 13 of the liquid products vending apparatus 4.

[0027] Lifting means 12 further include control means suitable to stop the electric motor moving the endless chain 19 when a glass is in its lower position 10 or in its upper positions 10" and to energise the electric motor, moving the endless chain 19, for lifting a filled glass from its lower position 10 to its upper position 10".

[0028] Said control means (including, for example, at least a sensor for sensing the position of a glass and/or of a grasping means 20) have been omitted in figure 2 as they are known to any person skilled in the art and in any case outside the scope of the invention.

[0029] Figure 3 shows a sectional front view of a vending machine according to the invention, where four infusion machines 9, positioned side-by-side and collecting on a known way they liquid product on the same glass, are provided.

[0030] Figure 3 provides for a second embodiment of the lifting device 12, which differs from that shown by figure 2 in that the grasp means 20 are orthogonal to the

plane defined by the endless chain 19 instead of being coplanar and in that coupling pins could be omitted on grasp means 20.

[0031] Figure 4 shows a front view of a preferred embodiment of the lifting means 12 of figure 3, where the endless chain 19 is a roller chain supported and moved in a known way through a pair of gears 21.

[0032] The grasp means 20 comprise at least a "L"-shaped body 22 pivotally connected to a body 25 integral to an element of the roller chain 19, the body 22 being connected to a roll 23 which moves in an "U"-shaped slide 24 to maintain the grasp means 20 horizontal when moving from their lower to their upper position to lift a glass from its lower position 10 to its upper position 10".

[0033] According to the embodiment shown in figure 4, the grasp means 20 further comprise a fork-shaped body supported by the "L"-shaped bodies 22.

[0034] Figure 5 shows a side view of the lifting means 12 of figure 4, where a portion of the roller chain 19, a portion of one of the gears 21 supporting and moving the roller chain 19 and a grasp means 20 comprising the roll 23 and supporting a glass on its lower position 10 and its upper one 10" are shown.

[0035] Figure 5 further shows a pair of optical sensors 26 suitable to sense the position of a glass and/or of grasping means 20 for controlling the electric motor moving the roller chain 19.

[0036] Figure 6a shows schematically a lateral view of a part of an infusion machine 9 wherein a portion of the continuous strip 6 is positioned, the single portions of products to be infused by the infusion machine 9 being allocated into a plurality of "blister" wrappings 8.

[0037] The remaining parts of the infusing machine 9 and the sprocket wheels 18 (figure 2) positioned at the opposite sides of the infusion machine 9 has been omitted to simplify the graphical representation.

[0038] Figure 6b shows a top view of a portion of the continuous strip 6 where a plurality of "blister" wrappings 8 and two series of holes (only one of which is labelled "21" in figure 6b to simplify the graphical representation), positioned on the longitudinal edges of the continuous strip 6 and wherein are engaged sprocket wheels 18 (figure 2), positioned at the opposite sides of the infusion machine 9 and not shown in figure 6b, are provided.

[0039] The "step" between two adjacent holes 21 is preferably corresponding to that between two adjacent "blister" wrappings 8 but, without departing from the scope of the invention, the "step" between two adjacent holes 21 could be rigidly related (for example, ½, 2/3 and so on) to that between two adjacent "blister" wrappings 8.

[0040] All modifications of and improvements in vending machines for solid and liquid products as suggested by experience and by the natural evolution of the technique may be effected by a person skilled in the art without departing from the scope of the invention

Claims

1. Vending machine for solid and liquid products, comprising a cabinet-type structure (1) inside which a solid products vending apparatus (3) and a liquid products vending apparatus (4) are installed one on the top of the other, characterised in that the delivery doors (13, 15) of the products delivered by the liquid products vending apparatus (5) and by the solid products vending apparatus (4) are positioned side-by-side on the cabinet's front panel (14) at on the same height from the ground.

2. Vending machine as defined in claim 1, characterised in that the delivery doors (13, 15) are arranged approximately in line with the half- way point of the cabinet's front panel (14).

3. Vending machine as defined in claim 1, characterised by comprising lifting means (12) suitable to lift the product delivered by the down-placed vending apparatus (3, respectively 4) at the relevant delivery door (13, respectively 15).

4. Vending machine as defined in claim 1, characterised in that the products delivered by the liquid products vending apparatus (4) are coffee, tea and similar items.

5. Vending machine as defined in claim 1, characterised in that the products delivered by the liquid products vending apparatus (4) are delivered in glasses

6. Vending machine as defined in claim 5, characterised by comprising at least an infusion machine (9) supplied by a continuous strip (6), wound onto a first reel (7), into which are inserted in "blister" wrappings (8) single portions of products for infusion used by the at least one infusion machine (9) to realise the liquid product collected in a glass.

7. Vending machine as defined in claim 6, characterised in that the product for infusion are in powder, in granules, in leaves or in any other form suitable for infusion.

8. Vending machine as defined in claim 6, characterised in that, when a "blister" wrapping (8) is empty, a portion of the continuous strip (6) is rewound to form a second reel (11).

9. Vending machine as defined in claim 8, characterised in that the length of the rewound portion of the continuous strip (6) is corresponding to the step between two adjacent "blister" wrappings (8).

10. Vending machine as defined in claim 8, characterised by further comprising a pair of sprocket wheels

(18) positioned at the opposite sides of each infusion machine (9) and engaged on two series of holes (21) positioned on the longitudinal edges of the continuous strip (6) to control the rotation of the second reel (11) and to stretch the portion of the continuous strip (6) positioned inside the infusion machine (9).

11. Vending machine as defined in claim 10, characterised in that the step between two adjacent holes (21) positioned on the longitudinal edges of the continuous strip (6) is corresponding to that between two adjacent "blister" wrappings (8).

12. Vending machine as defined in claim 10, characterised in that the step between two adjacent holes (21) positioned on the longitudinal edges of the continuous strip (6) is rigidly related to that between two adjacent "blister" wrappings (8).

13. Vending machine as defined in claim 3 and 5 where the down-placed vending apparatus is the liquid products vending apparatus (4), characterised in that the lifting means (12) comprise an endless chain (19) provided with at least one grasp means (20) suitable to receive the glass to be filled at its lower position (10) and in that, when the glass is filled, the endless chain (19) is moved to lift the glass to its upper position (10"), inside a "pocket" (14) positioned behind the delivery door (13) of the liquid products vending apparatus (4).

14. Vending machine as defined in claim 13, characterised in that the grasp means (20) comprises a fork-shaped body connected to a support integral to the endless chain (19) through coupling pins.

15. Vending machine as defined in claim 13, characterised in that the lifting means (12) further include control means suitable to stop the endless chain (19) when a glass is in its lower (10) or in its upper positions (10") and to move the endless chain (19) for lifting a filled glass from its lower position (10) to its upper position (10").

16. Vending machine as defined in claim 13, characterised in that the endless chain (19) is a roller chain and in that the at least one grasp means (20) comprise at least a "L"-shaped body (22) pivotally connected to a body (25) integral to an element of the roller chain (19), the "L"-shaped body (22) being connected to a roll (23) which moves in an "U"-shaped slide (24) to maintain the at least one grasp means (20) horizontal when moving from their lower to their upper position to lift a glass from its lower position (10) to its upper position (10").

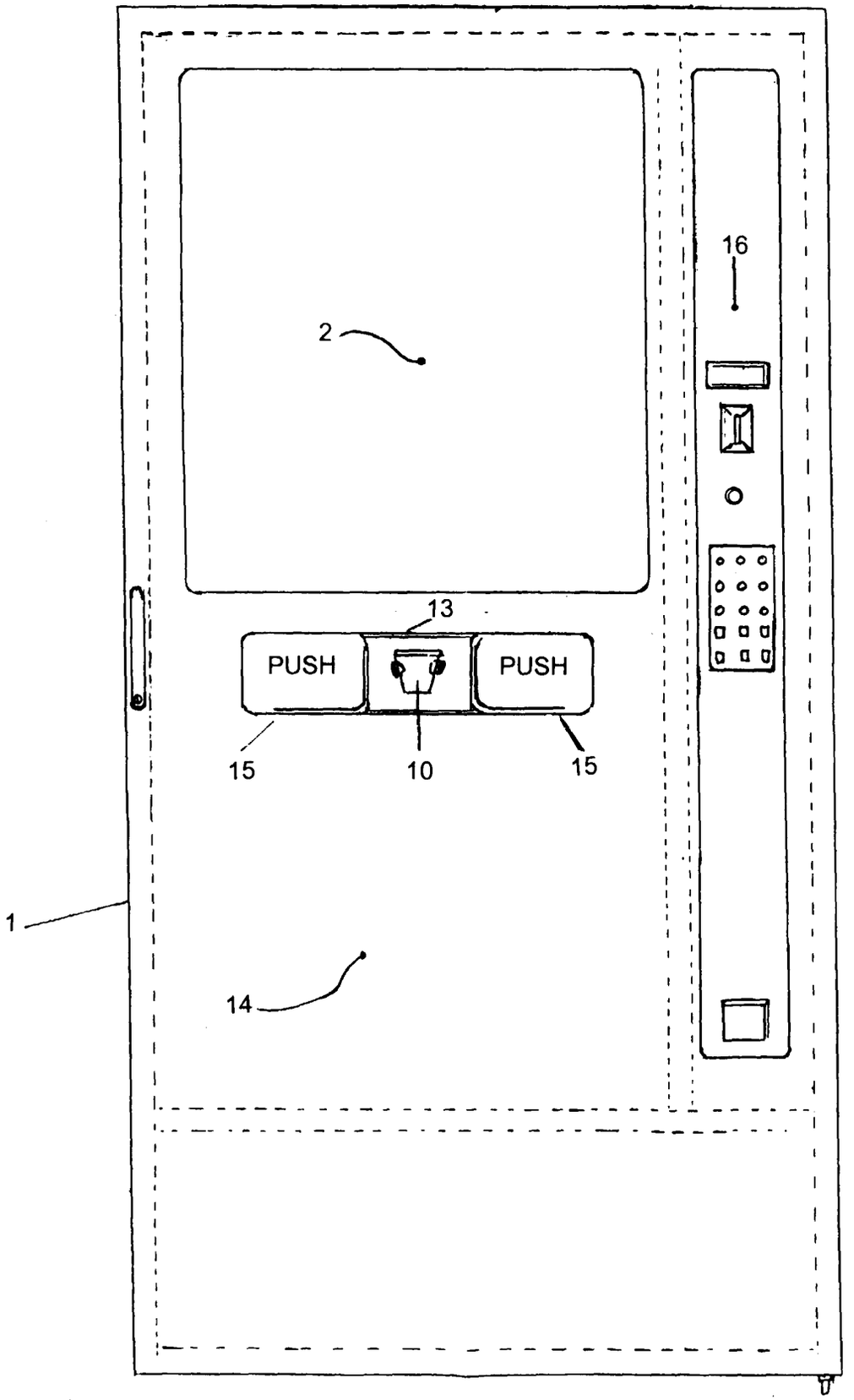


Figure 1

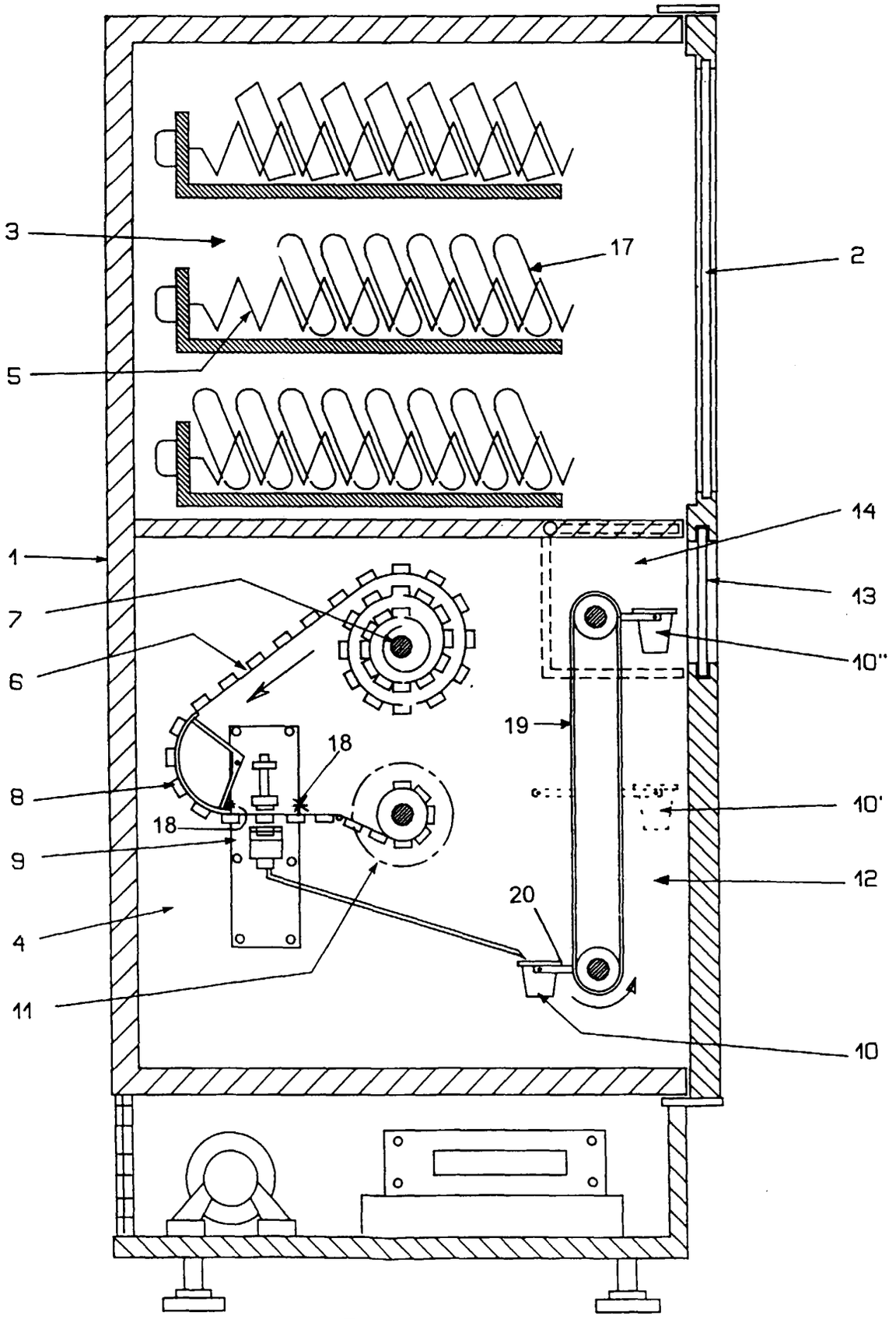


Figure 2

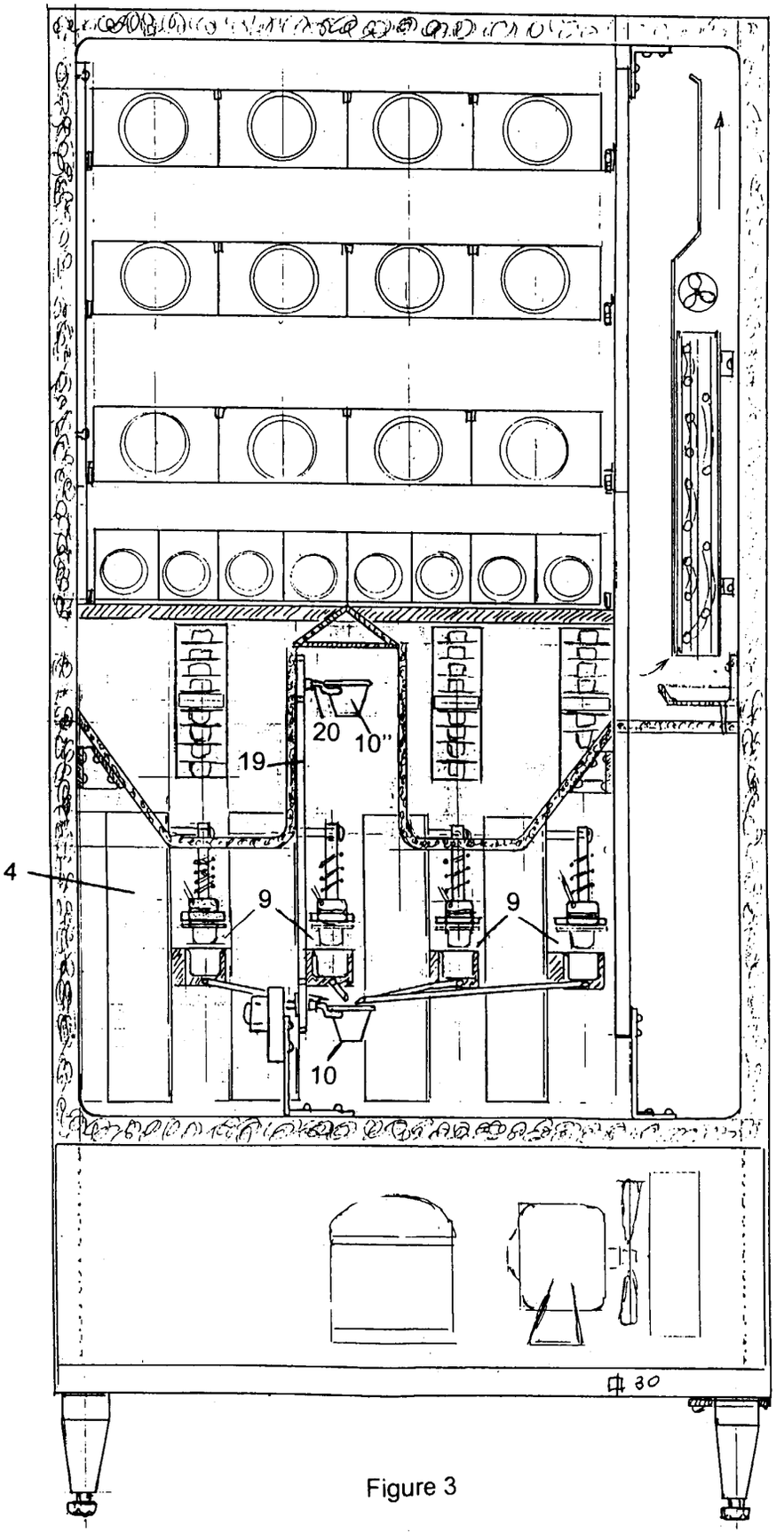


Figure 3

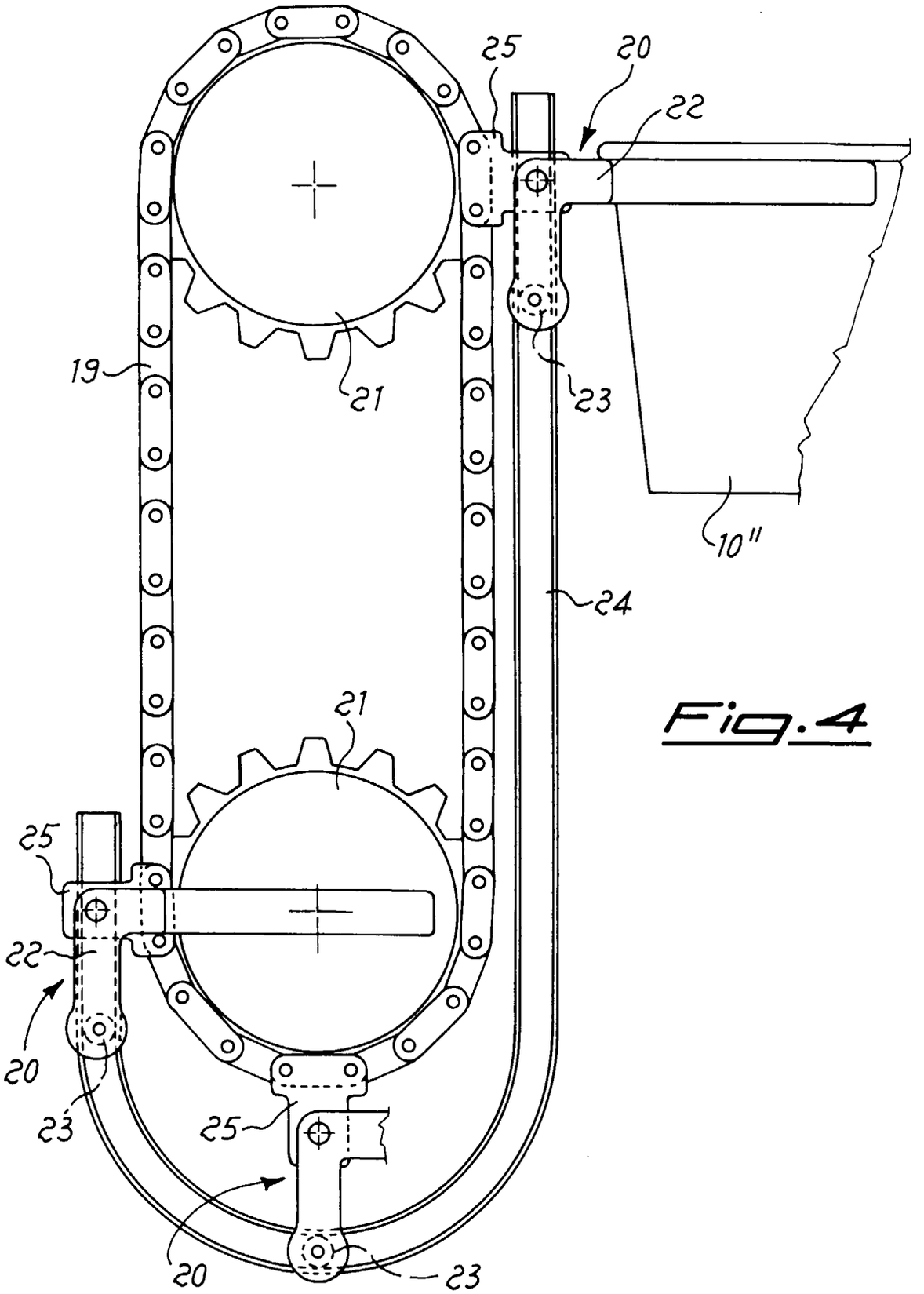
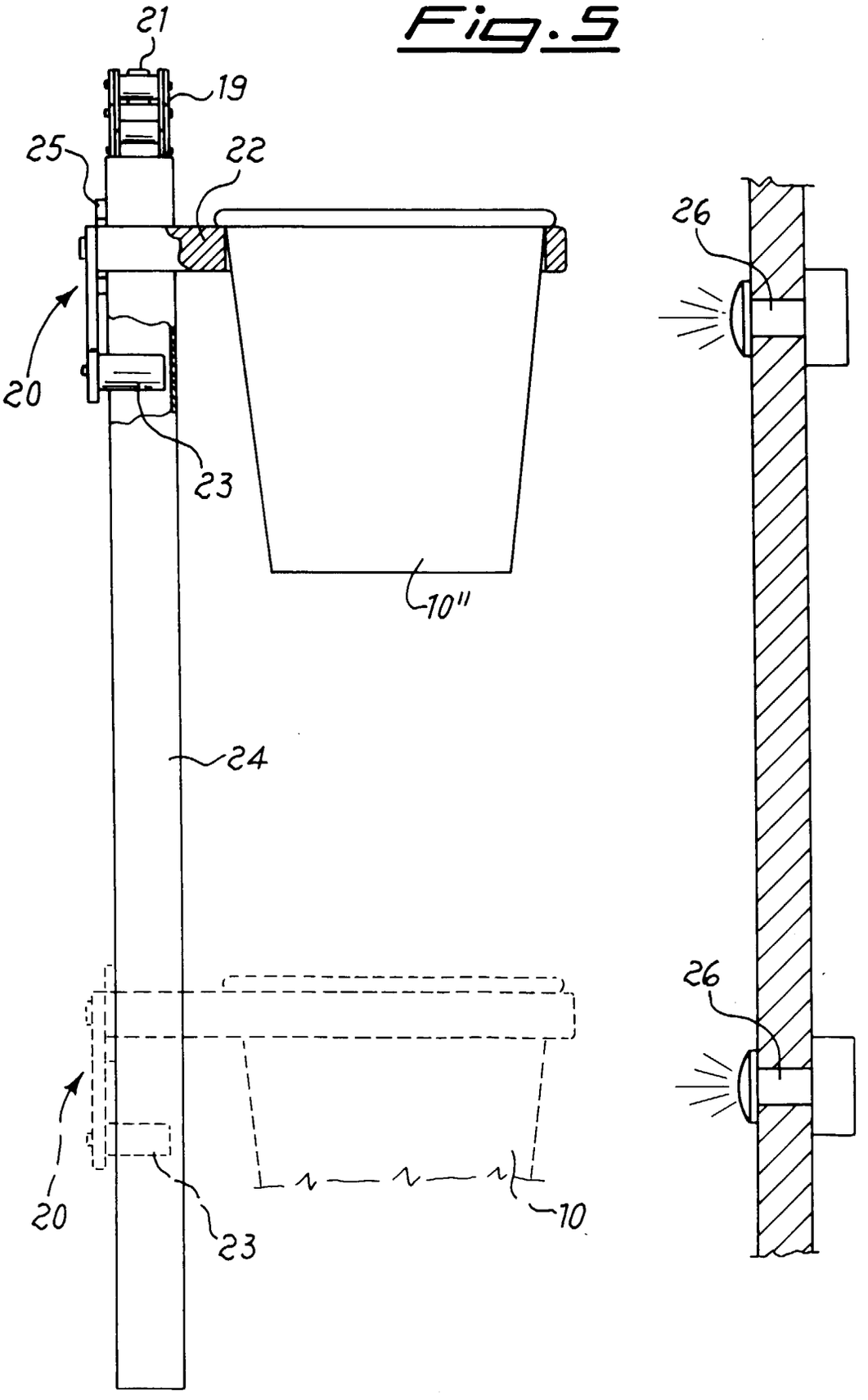


Fig.4

Fig.5



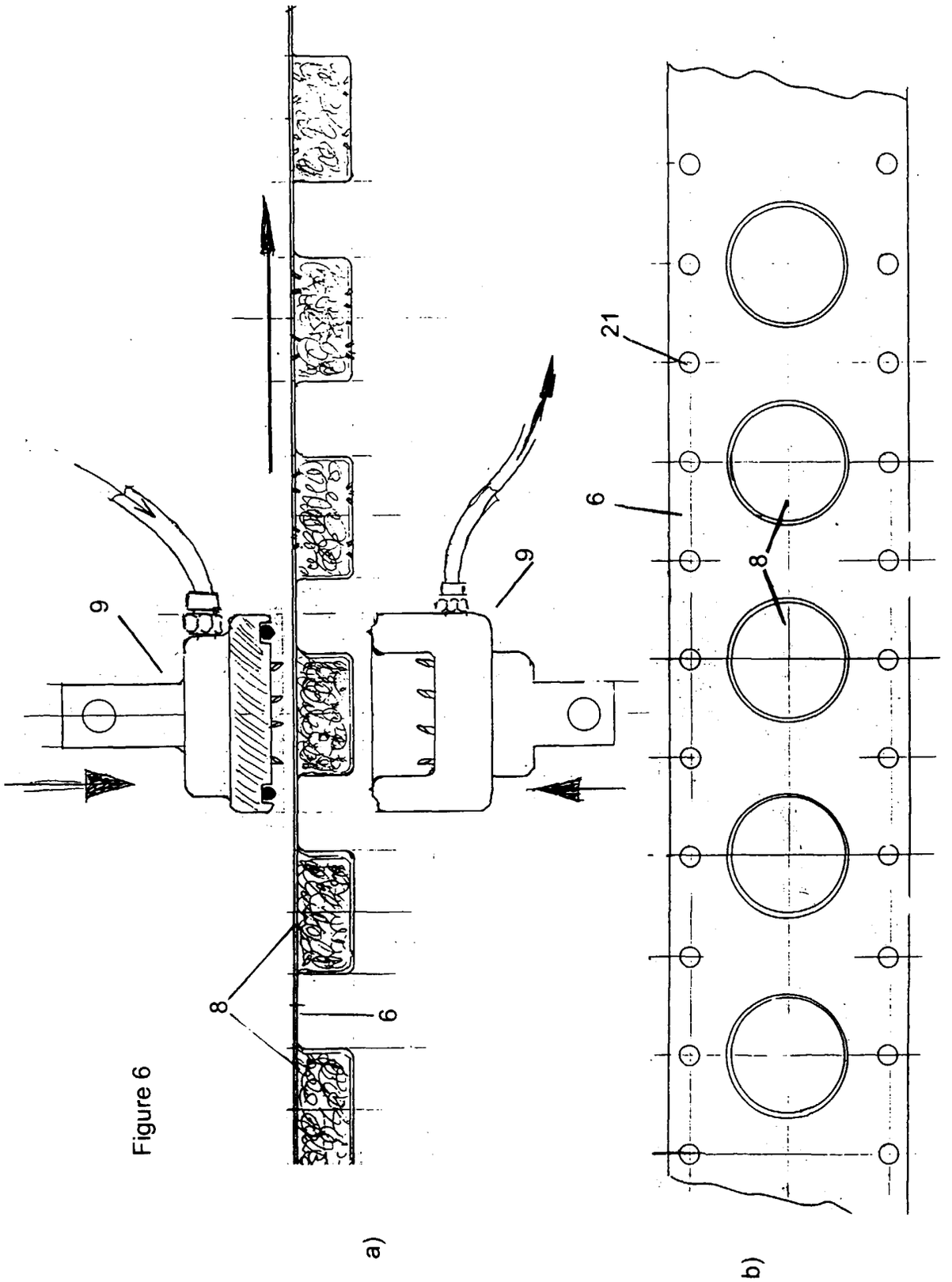


Figure 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 11 2244

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	9 March 2000	Wolles, B

CATEGORY OF CITED DOCUMENTS

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