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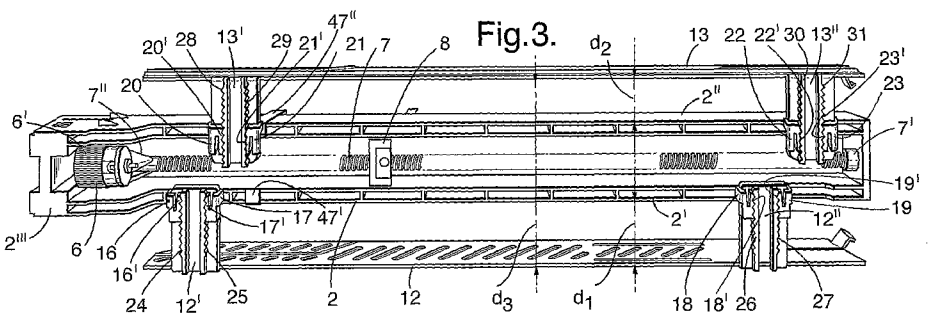
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(54) Title: DISPENSING DEVICE



(57) **Abstract:** A dispensing device (1) for use in a vending machine, the device having at least one support piece (2) extending in the longitudinal direction of the device, the support piece being provided with a merchandise article pusher (3) which is controllably driven by an electromotor (6) via a spindle (7) and a carrier (8) on the pusher (3) with which the spindle (7) rotatably engages, wherein the pusher (3), in a controllable manner, is arranged to push articles of merchandise (9, 9'; 51) with or without packaging towards a dispensing end (10) of a side wall equipped transport path (11). The distance (d1; d2) of the side wall (12; 13) from an adjacent, longitudinal side (2'; 2") of the support piece (2) is adjustable for adaptation of the width (d3) of the transport path to the width of the merchandise articles that are to be moved along the transport path and successively dispensed. The support piece (2) is in a first position of use designed to form the bottom of the transport path (11), and the support piece is in a second position of use, which is inverted 180° about the longitudinal axis of the device relative to its first position of use, designed to have mounted thereon an elongate merchandise article hanger (47) which extends along the transport path on the support piece, the article hanger being designed for sliding engagement with a suspension hole (50) in packaging (51) or a suspension tab for the merchandise article. The support piece forms support for the motor, spindle (7) and drive gear (14, 15) between the motor (6) and the spindle (7), and forms a guide for the pusher (3; 3, 3') and its carrier (8).

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Dispensing device

The present invention relates to a dispensing device for use in vending machines, the device having at least one support piece extending in the longitudinal direction of the device, the support piece being provided with a merchandise article pusher which is controllably driven by an electromotor via a spindle and a carrier on the pusher with which the spindle rotatably engages, wherein the pusher, in a controllable manner, is arranged to push articles of merchandise with or without packaging towards a dispensing end of a transport path, as disclosed in the preamble of attached claims 1 and 2.

A great many dispensing devices are previously known, and one such device is described in, inter alia, US Patent 6,604,652, wherein there are arranged in levels above one another trays having fixed, upright walls for forming pushing channels for articles of merchandise, typically tobacco articles such as cigarettes and the like. Each channel has its own drive motor that is connected to a spindle which is in threaded engagement with a merchandise article pusher in the pushing channel. Power transmission from the drive motor to the spindle takes place via pulleys and standard belt drive, and the motor is fixedly mounted on the tray. If there is a change in the width of the merchandise articles, a tray of this type must be completely remodelled or a new tray of the right channel width must be provided. This is therefore a cumbersome and costly solution if the owner of a vending machine wishes to change the merchandise article range and finds that the pushing channels in the machine do not quite fit the new product range as desired. Furthermore, standard belt drive is not a preferable solution, apart from it being able to act as a slip clutch in the event of the machine becoming jammed or the like, because there will be no possibility of measuring the exact position of the pusher in the pushing channel and thus the number of articles still present in the pushing channel.

Other known solutions can be seen from, inter alia, US Patent 2,590,736 and EP patent 1,119,830.

Accordingly, it has been an object of the present invention to remedy the disadvantages that appear to be associated with the prior art, and in such manner that replacement or adjustment of equipment in the vending machine can take place quickly and in a cost-effective manner. It has been a further object of the invention to arrive at a technical solution which enables not only the dispensing of articles of merchandise standing in a

row in a pushing channel, but also the dispensing of merchandise articles hanging in such a pushing channel.

According to a first aspect of the invention, the dispensing device is characterised in that it has at least one side wall, the distance of the side wall from the adjacent longitudinal side of the support piece being adjustable for adaptation of the width of the transport path to the width of the merchandise articles that are to be moved along the transport path and successively dispensed.

According to a second aspect of the invention, the dispensing device is characterised in that the support piece in a first position of use is designed to form the bottom of the transport path, and that the support piece in a second position of use, which is inverted 180° about the longitudinal axis of the device in relation to the first position of use, is designed to have mounted thereon an elongate support rail or loop which extends along the transport path of the support piece, the support rail or loop being designed for sliding engagement with a suspension hole in packaging or a suspension tab for the merchandise article.

In said first and second aspects, the support piece is in addition arranged to form support for the motor, spindle and drive gear between the motor and the spindle, and also forms a guide for the pusher and its carrier.

Additional embodiments of the invention will be apparent from attached subsidiary claims 3-18, and from the following description with reference to the attached drawings which show in a non-limiting manner the currently preferred embodiments of the invention.

Fig. **1** is a perspective view from above, the rear and one side of a first embodiment of the dispensing device in a first position of use according to the invention.

Fig. **2** is a perspective view from above, the rear and the other side of a first embodiment of the dispensing device in a first position of use according to the invention.

Fig. **3** shows the dispensing device from below and slightly tilted to the side.

Fig. **4** is a perspective view of the dispensing device from below.

Fig. **5** shows a second embodiment of the dispensing device having a second position of use that is inverted 180° about the longitudinal axis of the device in relation to the position of use shown in Figs. **1-4**, seen in perspective from behind, from one side and seen from below with respect to its second position of use according to the invention and intended for hanging articles of merchandise.

Fig. **6** is a perspective view of the dispensing device shown in Fig. **5**, from in front, from the opposite side and seen from below with respect to its second position of use.

Fig. **7** shows a detail of the device according to Figs. **5** and **6** for the hanging of a merchandise article, for example so-called blister packs.

Fig. **8** shows a detail of the dispensing device according to Figs. **1-7** with a motor control unit and device for detecting the position of the pusher.

Fig. **9** shows enlarged details of the side adjustment of a side wall in relation to the dispensing device support piece.

Fig. **10** shows a detail of the dispensing area of a pusher channel.

Fig. **11** shows details of the pusher and the merchandise article hanger for hanging articles of merchandise.

Fig. **12** illustrates two cooperating support pieces with side walls for use for dispensing particularly wide articles of merchandise.

Fig. **13** shows the principle of the mounting of a support piece on a wall in a vending machine.

Fig. **14** shows a simplified block diagram of the electrical/electronic cooperating functional parts included in the dispensing device.

In, inter alia, Figs. **1-5** there is shown a dispensing device **1** which is especially designed for use in a vending machine (not shown). The device has at least one support piece **2** which extends in the longitudinal direction of the device, and the support piece **2** is provided with a merchandise article pusher **3** which is controllably driven by an

electromotor **6** via a spindle **7** and a carrier **8** on the pusher **3** with which the spindle **7** rotatably engages. The pusher **3** is in a controllable manner arranged to push merchandise articles **9** with or without packaging towards a dispensing end **10** of a transport path **11** which is provided with side walls **12, 13**. The distance, for example **d1; d2,** that a side wall, for example **12, 13,** may have from an adjacent longitudinal side **2'; 2''** of the support piece **2** is adjustable for adaptation of the width **d3** of the transport path **11** to the width of the merchandise articles **9** that are to be moved along the transport path and successively dispensed.

It will be seen from, inter alia, Figs. **1-4** and **8** and **9** that the support piece **2** forms support for the motor **6**, the spindle **7** and drive gear in the form of gearwheels **14, 15** between the motor **6** and the spindle **7**, and also forms a guide for the pusher **3** and its spindle engaging carrier **8**.

As shown in Figs. **3** and **4** and in greater detail in Fig. **9**, the support piece **2** has sliding guides **16, 17; 18, 19; 20, 21** and **22, 23** with associated engaging hooks **16', 17'; 18', 19'; 20', 21'** and **22', 23'** for adjustably fixing the respective mounting brackets **12', 12''** and **13', 13''**of at least one side wall. As can be seen clearly from Fig. **9**, the mounting brackets, the mounting brackets **12', 13'** shown here, have toothed bars **24, 25** and **28, 29** for engagement with the engaging hooks **16', 17'** and **18', 19'**. Similar toothed bars **26, 27** and **30, 31** will of course be present on the two other mounting brackets **12''** and **13''**, as indicated in Figs. **3** and **4**.

As shown in Figs. **1, 2, 6** and **10**, the side walls **12; 13** at or close to the dispensing end 10 of the transport path have a split **32; 33** so that a portion **12'''; 13'''** moulded in one piece with the wall **12; 13** will bear resiliently against a side portion of at least the merchandise article **9'** which is closest to the dispensing end **10**. Furthermore, at the dispensing end **10**, at the free end of the respective portion **12'''; 13'''**, there are respective inwardly directed hooks **12''; 13''''**. The hooks and the spring portions will together retain the outermost article of merchandise until with the aid of the pusher **3** it is pushed with force past the elastically yielding hooks **12''''; 13''''**. As can be seen clearly from Fig. **10**, the support piece **2** has at the dispensing end **10** of the transport path a bevelled portion **2'''** projecting transverse to the path, which serves to give the merchandise article **9'** that is to be discharged a gentle lift up from the bottom of the transport path **11**, so that the merchandise article **9'** has a more marked departure from the dispensing device and with minimum friction against said bottom. The portion **2'''** also serves to form a retainer for the front bottom edge of the merchandise article **9'**, so

that it remains standing stably at the dispensing end **10** prior to dispensing. In addition, the bevelled portion **2'''**, together with the yielding hooks **12''''**, **13''''**, represents a marked edge area at the dispensing end **10**, where the merchandise article **9'** will experience some physical resistance from it and will thus result in the drive motor **6**, in order to maintain a constant feed rate of the pusher **3; 3, 3'**, having to be given greater driving torque by an increase of motor current, which is controlled by a motor control unit **55**. The functions of the motor control unit **55** are otherwise explained in more detail later in the description.

At the rear end area of the support piece **2** there are formed at least two suspension hooks **34, 35** and/or **36, 37** intended for cooperation with a suspension mounting, see Fig. **13**, which is provided with suspension holes **39-42**, for example a plate, the hooks located uppermost at any given time, in Fig. **13** shown as **34; 35**, being adapted for engagement with suspension holes **39; 40** in the mounting, whilst the lowermost hooks **36, 37** are arranged for abutment against the portion of the mounting **38** which does not have holes. This means that the dispensing device **1** is given a slight upward inclination of the transport path in the forward direction or the dispensing direction, which is favourable for the operational performance of the device for dispensing merchandise articles, as not only in the case of lighter merchandise articles, but also in the case of heavier articles, it prevents them from sliding uncontrollably towards the dispensing end. To secure the device to the mounting **38**, mounting holes **43, 44** for fixing screws are provided in the end area, such as shown, for example, in Fig. **13**, a screw can pass through the hole **44** and be fastened in a hole **45** (not visible). Similarly, it will be seen that in cooperation with the suspension hook holes **41, 42** in the mounting **38** there is a screw fastening hole **46**. If the dispensing device **1** is turned about its longitudinal axis 180° so that it can be used for hanging merchandise articles, as shown in Figs. **5-7** and **11**, it will in this case be the hooks **37, 36** that are hooked into the respective holes **39, 40**, whilst the hooks **34, 35** then come to rest against the portion of the mounting **38** that does not have holes, and that a screw is passed through the hole **43** and is fastened in the hole **45**.

As mentioned in the introduction, one of the objects of the invention is to provide a dispensing device that is capable of dispensing articles of merchandise which it is necessary to allow to hang. Certain types of merchandise articles are packed in such manner that they are unsuitable for pushing along a channel with a bottom and side walls, as just illustrated and described. This relates in particular to articles of merchandise with packaging that does not have right angles, articles with an irregular

outer surface, and articles that are packed in so-called blister packs, and a feature that is common to all of these is that they cannot rest in a stable manner on a surface.

However, the present invention solves the dispensing of such merchandise articles and their packaging or hanging means, if any, in a simple and very neat manner.

As illustrated and described, in particular in connection with the first position of use according to Figs. **1-4**, the support piece **2** in this first position will be adapted to form the bottom of the transport path **11** with side walls **12, 13**. The unique solution according to the invention is that the support piece **2** in a second position of use, as shown in Figs. **5, 6** and **11**, and with respect to other details, also in Figs. **7-9**, is inverted 180° about the longitudinal axis of the device relative to the first position of use and in this second position of use is adapted to have mounted thereon a merchandise article hanger **47**, for example, an elongate support rail or loop, which extends along the transport path on the support piece **2** from a securing aperture or apertures **48, 49** in the rear, forward facing part **2''''** of the support piece, the merchandise article hanger **47** being designed for sliding engagement with suspension hole **50** in the packaging **51** or a suspension tab (not shown) for the merchandise article. The hanger **47** may, apart from being secured in the said apertures **48, 49**, also be fastened to the support piece **2** slightly closer to the dispensing end **10** by fastening clips **47', 47''**. This ensures a multi-point, steady support of the hanger **47**, and on the right choice of material for the hanger, the hanger **47** will extend essentially parallel to the longitudinal axis of the dispensing device and the transport path **11**, even when heavy articles are hung on it

As shown in Figs. **5, 6** and **11**, the length of the pusher **3** perpendicular to the length of the support piece **2** may be optionally extendible by means of a snap-on extension piece **3'**. This may be useful if a merchandise article has a height that is substantially larger than the normal height of the pusher **3**.

It is of course possible to allow a computer to have an overview of how many articles of merchandise from each dispensing device in a vending machine are dispensed over time, but an extra security control is provided in that the position of the pusher along the transport path **11** in each dispensing device is detectable. Such detection can be carried out by the gearwheel **15** which also serves as a detection wheel in gear connection **14** with the drive shaft **52** of the motor and an optical position sensor **53, 53'** adapted to detect angularly separated markers **57** (a total of 11 shown on the detection wheel **15**). One end of the spindle 7, i.e., the rear end **7'''**, forms, as shown in Fig. **8**, a fixed

connection with the rotatable gearwheel **15** which has the said markers **57**. The optical sensor **53, 53'** which is connected to the motor control unit **55** is adapted to detect the successive passing of the markers **57** and thus calculate the position of the pusher **3** as a function of the rotation of the spindle **7**.

As shown in Figs. **1-5**, an override lever **54** is arranged on the support piece **2** which upon activation (depression) is adapted to actuate the motor control unit **55** containing the motor control electronics (not shown in Fig. **8**) to move the pusher back to a rear nominal position on the support piece. As shown in Fig. **8**, this takes place in that the lever **54** has an end **54'** which on depression of the lever will move from a normal position in a slightly outward direction as indicated by the arrow **54'**. Thus, a light path between the sensor's light emitter **53** and light receiver **53'** is interrupted and when this happens the light receiver **53'** will trigger the motor control unit **55** to operate the motor **6** as desired. In the rear position of the pusher **3**, the dispensing device will then be able to be filled with merchandise articles if there is still room for extra ones. The sensor **53, 53'** may be mounted on a circuit board **56.** The motor control unit **55** may optionally be mounted on such a circuit board **56** or be separate, and the circuit board **56** is fastened, for instance, by being snapped onto mounting brackets **58, 58'**.

The motor control unit **55** also permits adaptive control of the driving torque of the motor **6** in relation to the power that is needed to maintain essentially the same pushing rate of the pusher **3; 3, 3'** during dispensing, irrespective of how many articles of merchandise are in the transport path **11**. This control is obtained by allowing the motor control unit **55** to register the rotational speed of the gearwheel **15** using the markers **57** which are detected by the sensor **53, 53'** and adjusting the driving torque with extra help from a signal from a current meter **59** which measures the motor's driving current, so that the rate at which the markers pass the sensor **53, 53'** is kept as constant as possible.

With the solution shown in Fig. **12** where two pushers **3** are to effect the advance of relatively wide merchandise articles, it will be important that the pushers **3,** which are in this case driven by lateral drive motors **6** (not visible in Fig. **11**), are both driven at the same drive speed and driving force each time an article of merchandise is to be dispensed, to prevent the articles from being dispensed askew. The motor control unit **55** will in this case sense the speed of motion of the respective pushers as a function of the rotational speed of associated driving wheel **15** and adjust the speeds of the pushers so they are the same. This happens in cooperation with the said motor current meter **59**,

so that adapted driving torque as a function of current to the motors maintains identical speeds of motion for all pushers.

Instead of having a common support piece for all the dispensers in a vending machine, as mentioned in the introduction as known, the present invention, as suggested as a non-limiting example in Fig, **12**, allows, for example, at least two support pieces **2** with respective motor-driven spindle-actuatable pusher **3**, to be arranged side by side. A solution of this kind will of course be possible whether the merchandise articles are of the standing type or hanging type. In such a case it will be only the longitudinal support piece sides **2', 2''** which lie laterally outermost in the assembly that are provided with distance-adjustable side walls **12, 13** for the substantially wider transport path.

A production and assembly economising solution for the dispensing device according to the invention is that the support piece **2** and its transport path portion **11**, the supports **7', 7** , of the spindle **7**, the drive motor mount **6'**, support for the driving gear connection **14, 15** between the motor **6** and the spindle **7**, the sliding guides **16-22** and engagement hooks **16' – 22'** for the side wall mounting brackets **12', 12'', 13', 13''**, mounting brackets **58, 58'** for the circuit board **56**, fasteners **48, 49** for the suspension rail or loop **47**, the lever **54, 54'** and the suspension hooks **34-37** are moulded in one piece of a plastic material.

Furthermore, as previously suggested, each of the side walls **12; 13** and their respective mounting brackets **12', 12''; 13', 13''** with respective toothed bars **24, 25, 26, 27; 28, 29, 30, 31** may be moulded in one piece of a suitable plastic material.

This means that the dispensing device in terms of production will be significantly cheaper than previously known dispensing devices, whilst assembly, repairs and maintenance and use adjustments will be considerably simplified.

As can be seen from Fig. **14**, the motor control unit **55** connected to the electromotor **6** is adapted to measure the driving current of the electromotor using a current meter **59**, The torque of the spindle **7** and thus the thrust on the merchandise articles may therefore easily be computed as a function of the current intensity. This is a very important extra function for the monitoring and control of the whole dispensing device.

Patent claims

1.

A dispensing device for use in a vending machine, the device having at least one support piece extending in the longitudinal direction of the device, the support piece being provided with a merchandise article pusher which is controllably driven by an electromotor via a spindle and a carrier on the pusher with which the spindle rotatably engages, wherein the pusher, in a controllable manner, is arranged to push articles of merchandise with or without packaging towards a dispensing end of a transport path, characterised in that it has at least one side wall, the distance of the side wall from an adjacent longitudinal side of the support piece being adjustable for adaptation of the width of the transport path to the width of the merchandise articles that are to be moved along the transport path and successively dispensed, and that the support piece forms support for the motor, the spindle and drive gear between the motor and the spindle, and forms a guide for the pusher and its carrier.

2.

A dispensing device for use in a vending machine, the device having at least one support piece extending in the longitudinal direction of the device, the support piece being provided with a merchandise article pusher which is controllably driven by an electromotor via a spindle and a carrier on the pusher with which the spindle rotatably engages, wherein the pusher, in a controllable manner, is arranged to push articles of merchandise with or without packaging towards a dispensing end of a transport path, characterised in the support piece in a first position of use is designed to form the bottom of the transport path, that the support piece in a second position of use, which is inverted 180° about the longitudinal axis of the device relative to its first position of use, is designed to have mounted thereon an elongate support rail or loop which extends along the transport path on the support piece, the support rail or loop being designed for sliding engagement with a suspension hole in packaging or a suspension tab for the merchandise article, and that the support piece forms support for the motor, spindle and drive gear between the motor and the spindle, and forms a guide for the pusher and its carrier.

3.

A dispensing device as disclosed in claim 2, characterised in that it has at least one side wall, the distance of the side wall from the adjacent longitudinal side of the support piece being adjustable for adaptation of the width of the transport path to the width of

the merchandise articles that are to be moved along the transport path and successively dispensed.

4.

A dispensing device as disclosed in claim 1 or 3, characterised in that the support piece in addition has sliding guides and engaging hooks for adjustable fixing of the mounting brackets of at least one side wall.

5.

A dispensing device as disclosed in claim 1 or 3, characterised in that the side walls at or close to the dispensing end of the transport path have a split in order, with the aid of a portion moulded in one piece with the wall, to bear resiliently against a side portion of at least the merchandise article that is closest to the dispensing end.

6.

A dispensing device as disclosed in any one of claims 1-5, characterised in that the support piece at the dispensing end of the transport path has a bevelled portion projecting transverse to the path.

7.

A dispensing device as disclosed in claim 1 or any one of claims 3-6 when subsidiary to claim 1, characterised in that the support piece in a first position of use is designed to form the bottom of the transport path, and that the support piece in a second position of use, which is inverted 180° about the longitudinal axis of the device, is designed to have mounted thereon a merchandise article hanger, for example, an elongate support rail or loop, which extends along the transport path on the support piece, the merchandise article hanger being designed for sliding engagement with a suspension hole in packaging or a suspension tab for the merchandise article.

8.

A dispensing device as disclosed in one or more of claims 1-7, characterised in that the length of the pusher perpendicular to the support piece is optionally extendible by means of a snap-in extension piece.

9.

A dispensing device as disclosed in one or more of claims 1-8, characterised in that the position of the pusher along the transport path is registrable by means of a detection

wheel in gear connection with the motor drive shaft and a position detector designed to detect equally spaced markings on the detection wheel.

10.

A dispensing device as disclosed in claim 9, characterised in that on the support piece there is arranged an override lever which on activation is designed to actuate a motor control unit in order to move the pusher back to a rear nominal position on the support piece.

11.

A dispensing device as disclosed in one or more of the preceding claims, characterised in the support piece in a rear end area is provided with at least two pairs of suspension hooks intended for cooperation with a perforated suspension mounting, for example, a plate, wherein the hooks located uppermost at any given time are adapted for engagement with suspension holes in the mounting, whilst the lowermost located hooks are adapted to rest against a portion of the mounting that does not have holes.

12.

A dispensing device as disclosed in claim 11, characterised in that in connection with the suspension hooks there are provided mounting holes for fixing screws.

13.

A dispensing device as disclosed in one or more of claims 1-12, characterised in that the dispensing device is designed to be suspended at its rear end area, so that the transport path and/or merchandise article hanger is thus given an ascending gradient in the direction of the dispensing end.

14.

A dispensing device as disclosed in one or more of the preceding claims, characterised in that at least two support pieces equipped with a respective motor-driven, spindle-actuatable pusher, are arranged side by side, and that only the longitudinal support piece sides which lie laterally outermost are provided with distance-adjustable side walls for the transport path.

15.

A dispensing device as disclosed in one or more of claims 1-14, characterised in that the transport path portion of the support piece, the spindle supports, the drive motor mount,

the support for the gear connection between the motor and the spindle, the sliding guides and engaging hooks for side wall mounting brackets, mounting brackets for motor control, fastenings for the suspension rail or bar, the lever and the suspension hooks are moulded in one piece in a suitable plastic material.

16.

A dispensing device as disclosed in one or more of claims 1-15, characterised in that the side wall and its mounting brackets are moulded in one piece in a suitable plastic material.

17.

A dispensing device as disclosed in one or more of claims 1-16, characterised in that a motor control unit connected to the electromotor is adapted to compute the driving torque of the electromotor on the spindle and thus the thrust on the merchandise articles as a function of the magnitude of the motor's driving current.

18.

A dispensing device as disclosed in one or more of claims 1-17, characterised in that one end of the spindle forms a connection with a rotatable wheel which has angularly separated markers, and that an optical sensor coupled to the motor control unit is adapted to detect the successive passing of the markers and thus calculate the position of the pusher as a function of the rotation of the spindle.

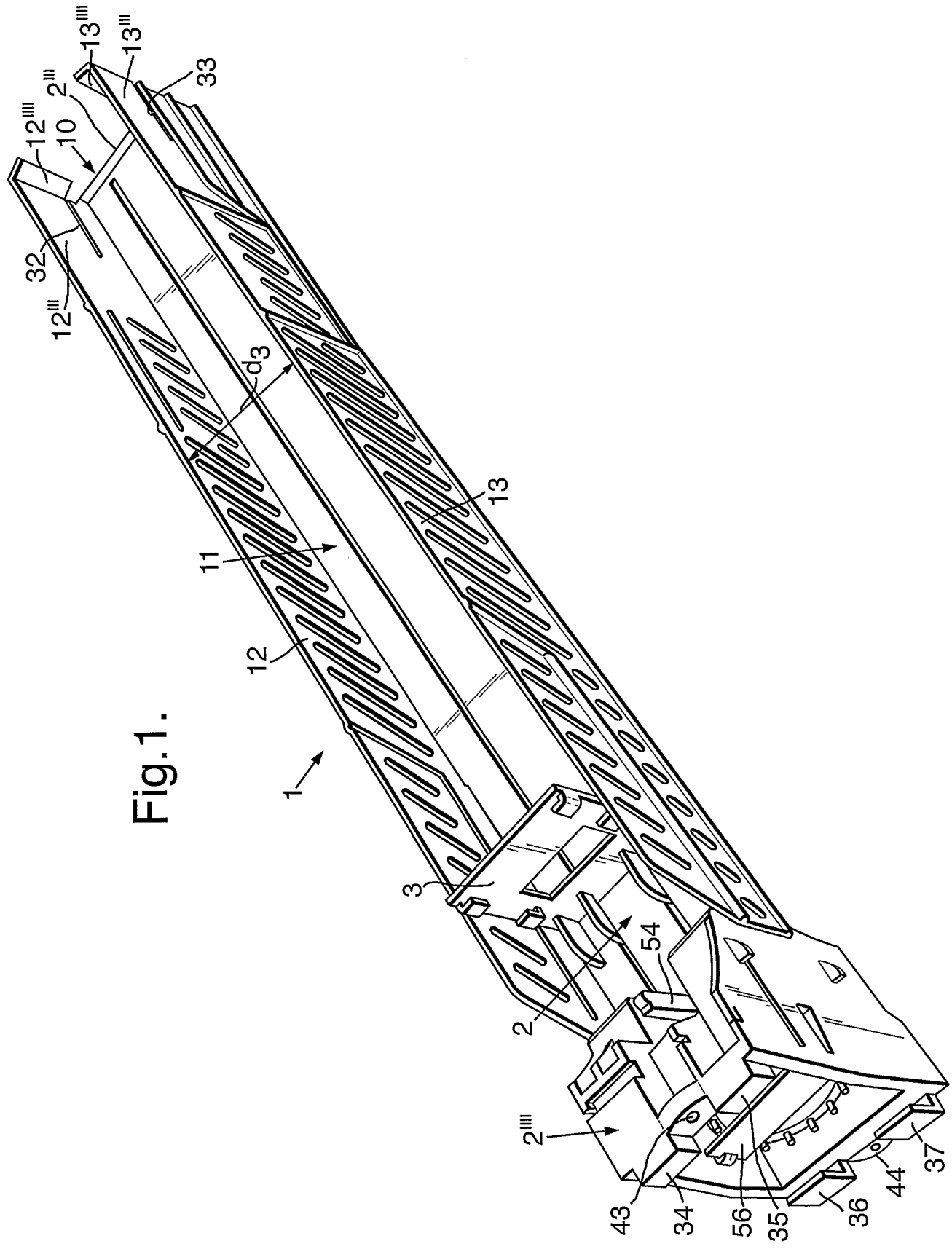

13IIII
13III
2III
33
12IIII
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32
12III
d3
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37

Fig.1.

Fig.2.

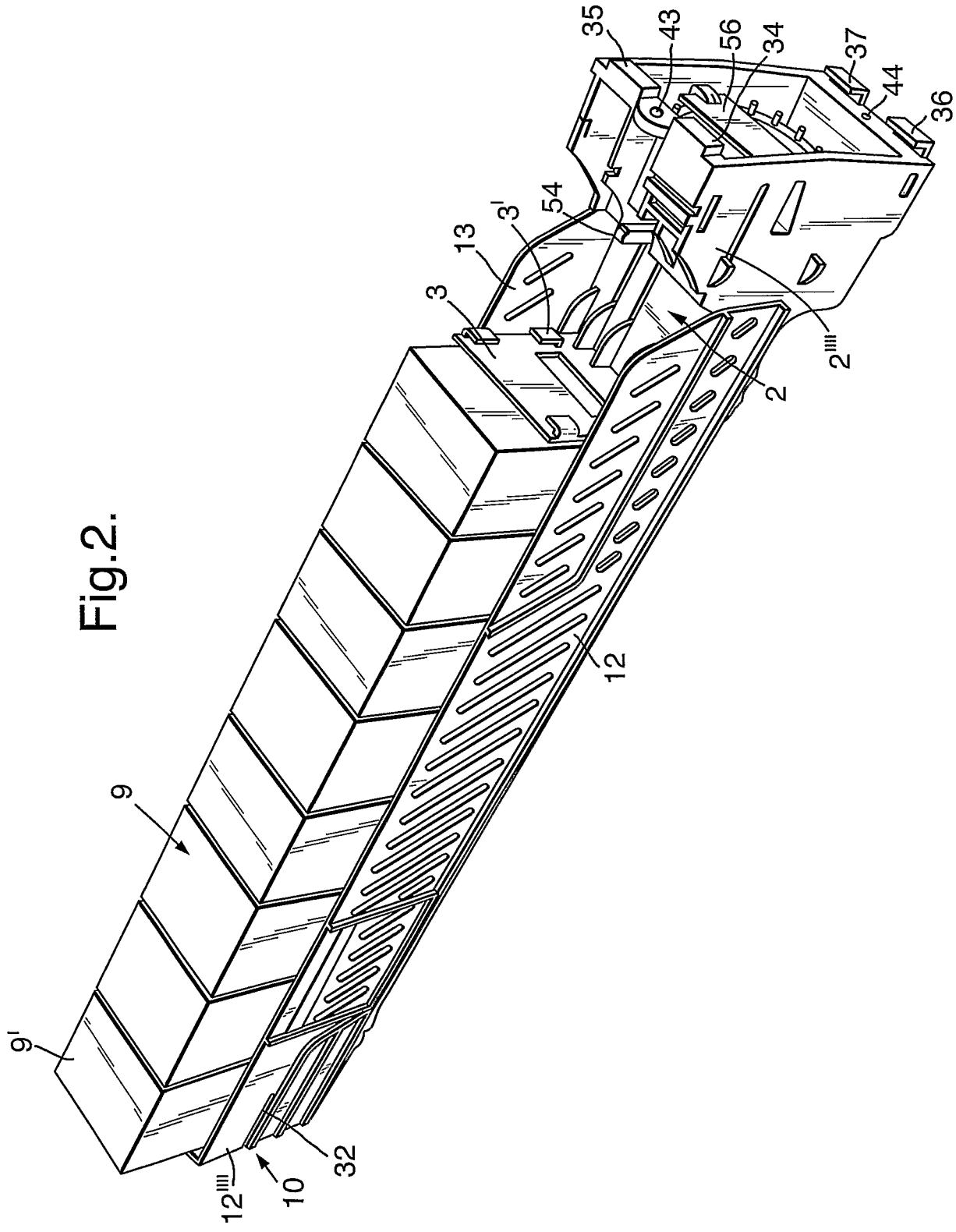


Fig.3.

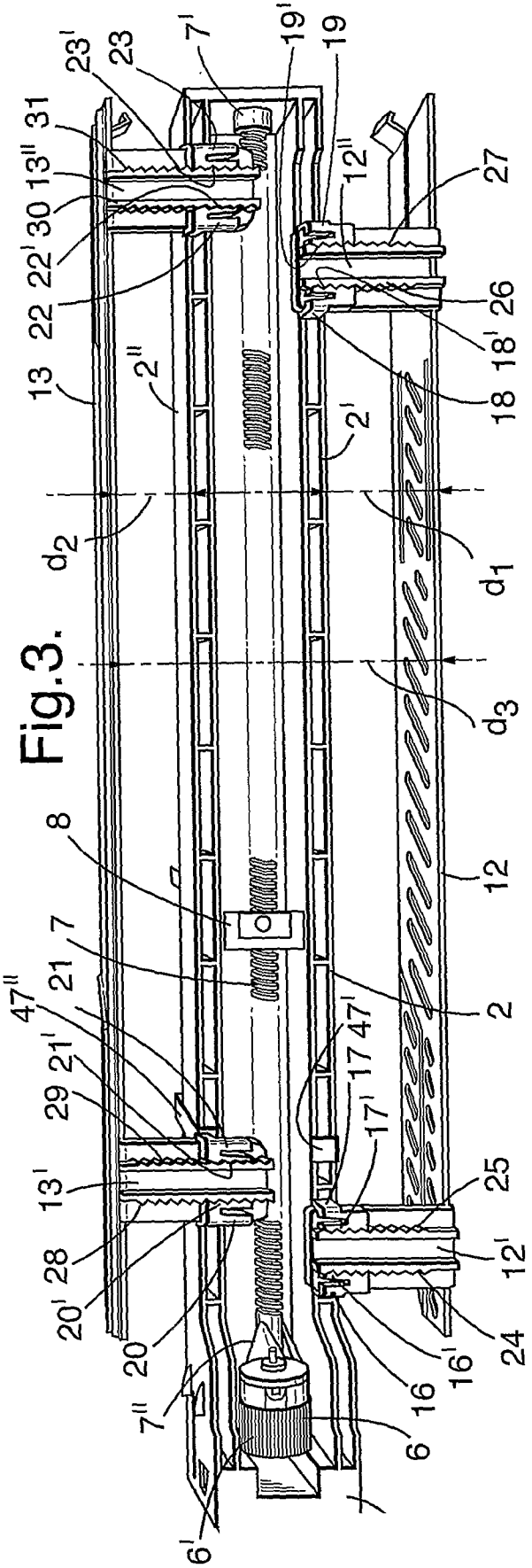

23'
23
7'
19'
19
31
13''
30
22'
22
12''
27
13
2''
2'
18
18'
26
d2
d1
d3
8
12
7
2
47''
21
21'
29
13'
17
17'
47'
25
28
12'
20'
20
24
7''
16'
16
6
6'

Fig.4.

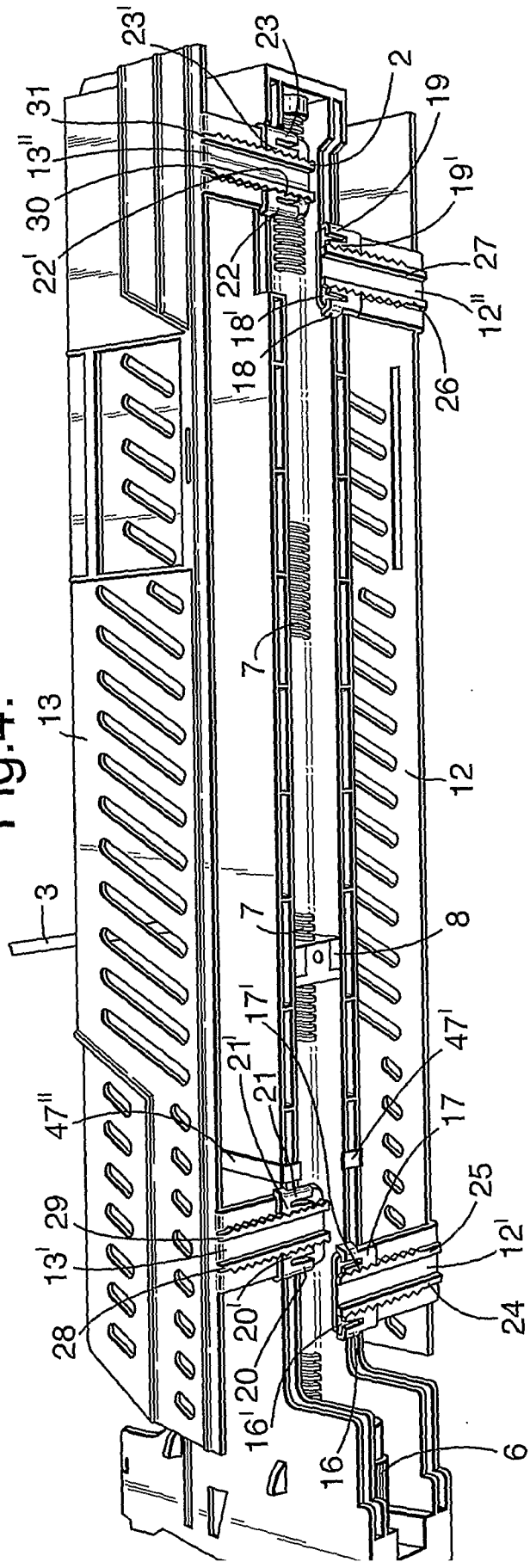
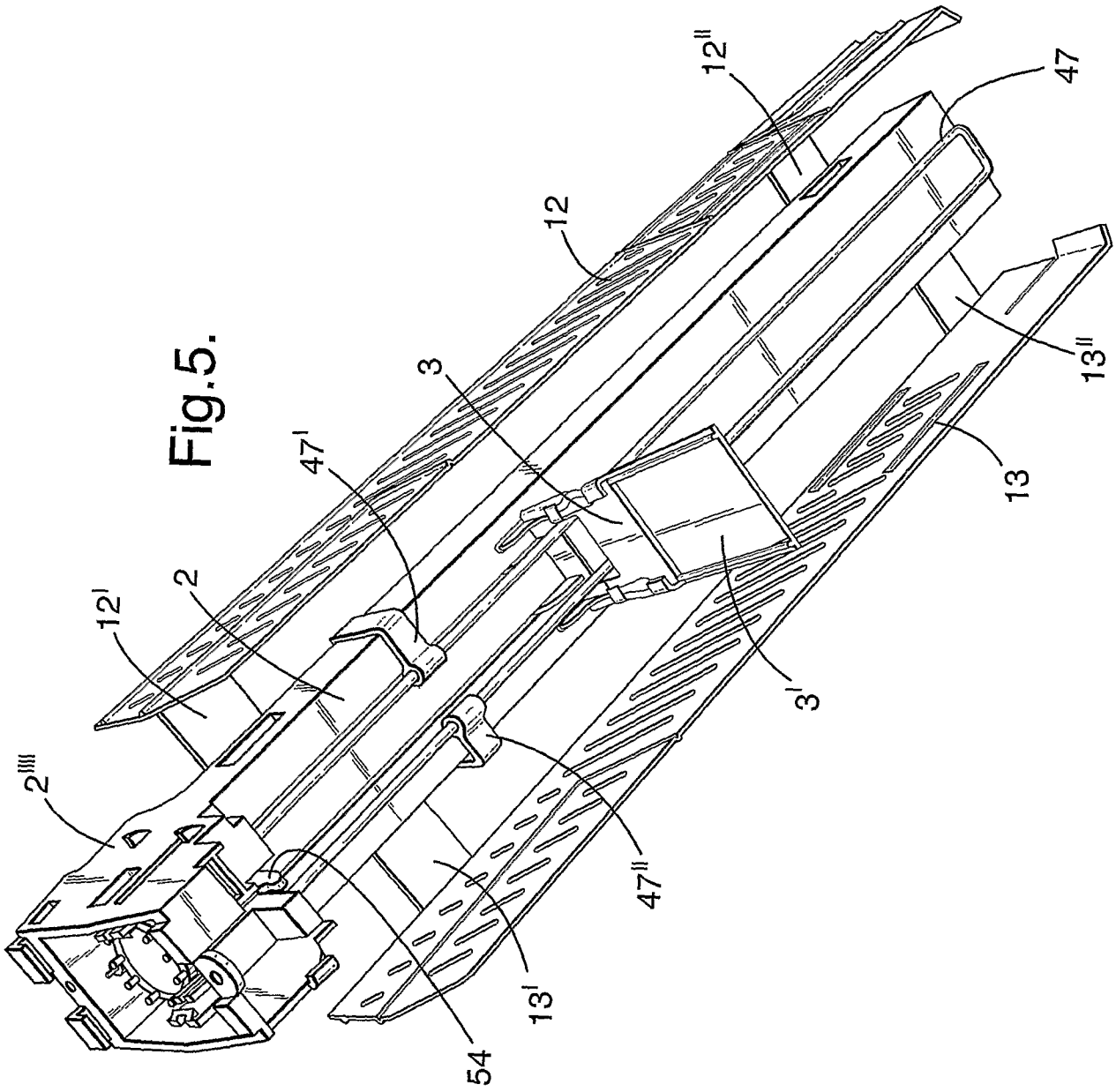

23'
23
2
19
31
13''
30
22'
19'
22
27
18
18'
12''
26
7
13
12
3
8
7
17'
21'
21
47'
47''
17
25
29
13'
12'
28
20'
24
20
16'
16
6

Fig.5.



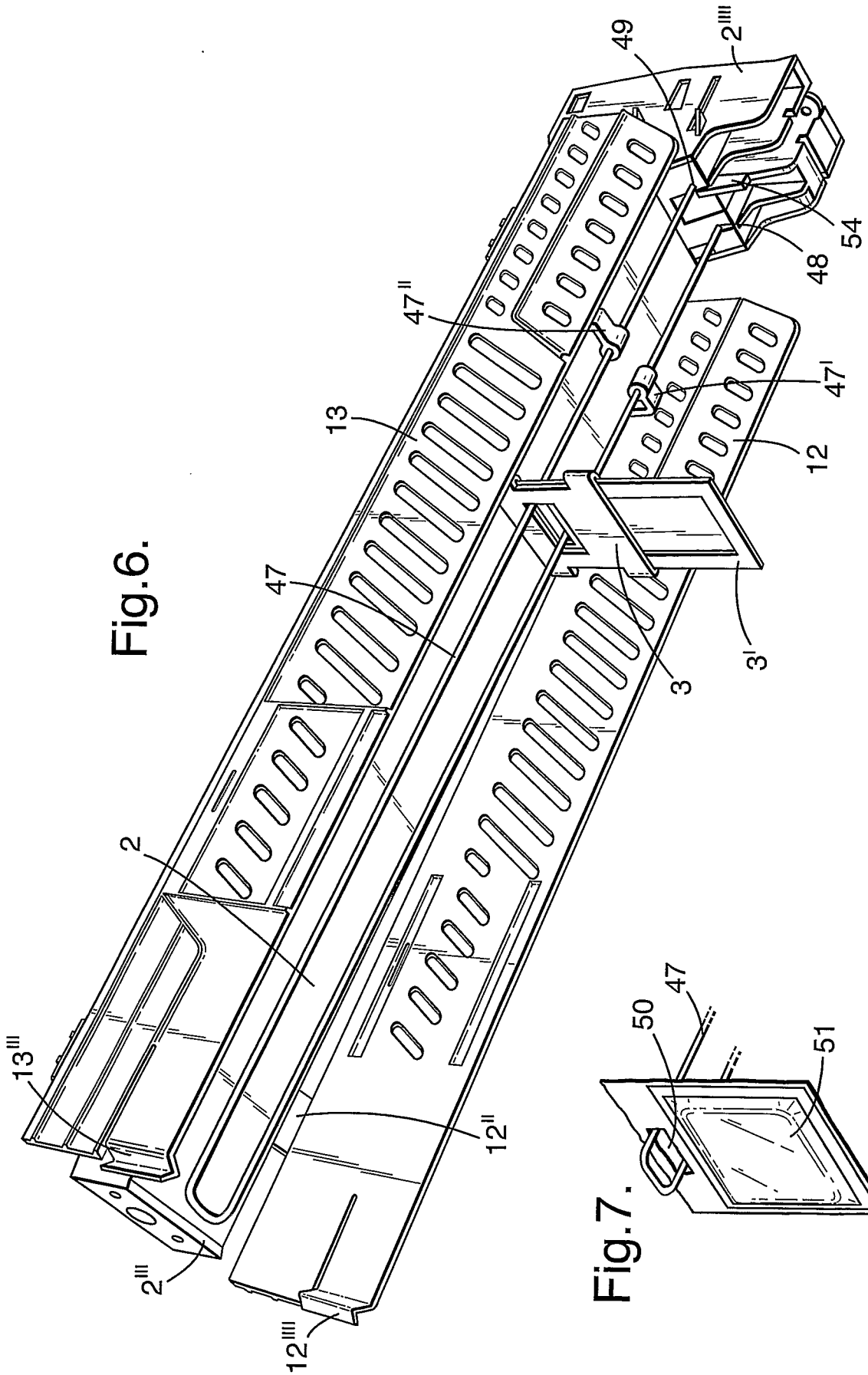

49
2IIII
54
48
47II
47I
13
12
47
3I
3
2
13III
12II
2III
12IIII

Fig.6.

47
50
51

Fig.7.

Fig.8.

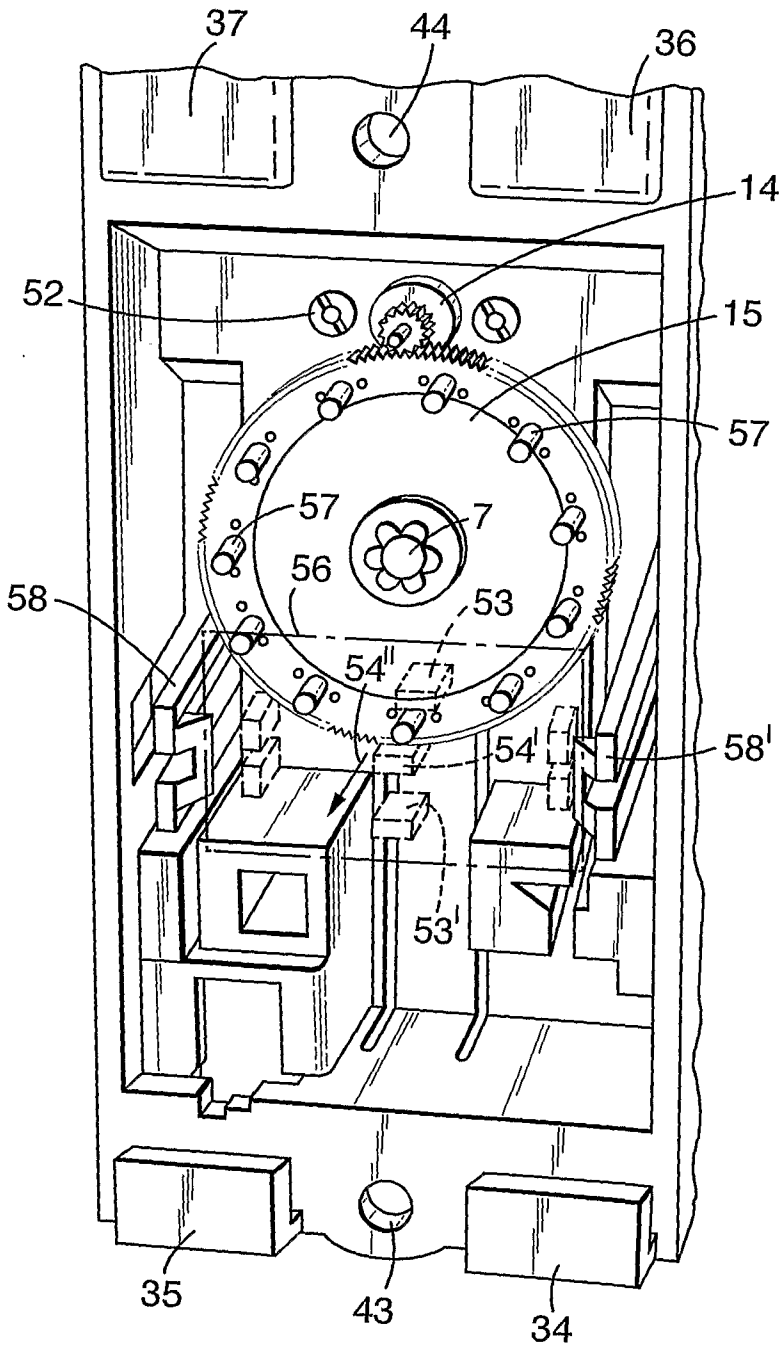


Fig.9.

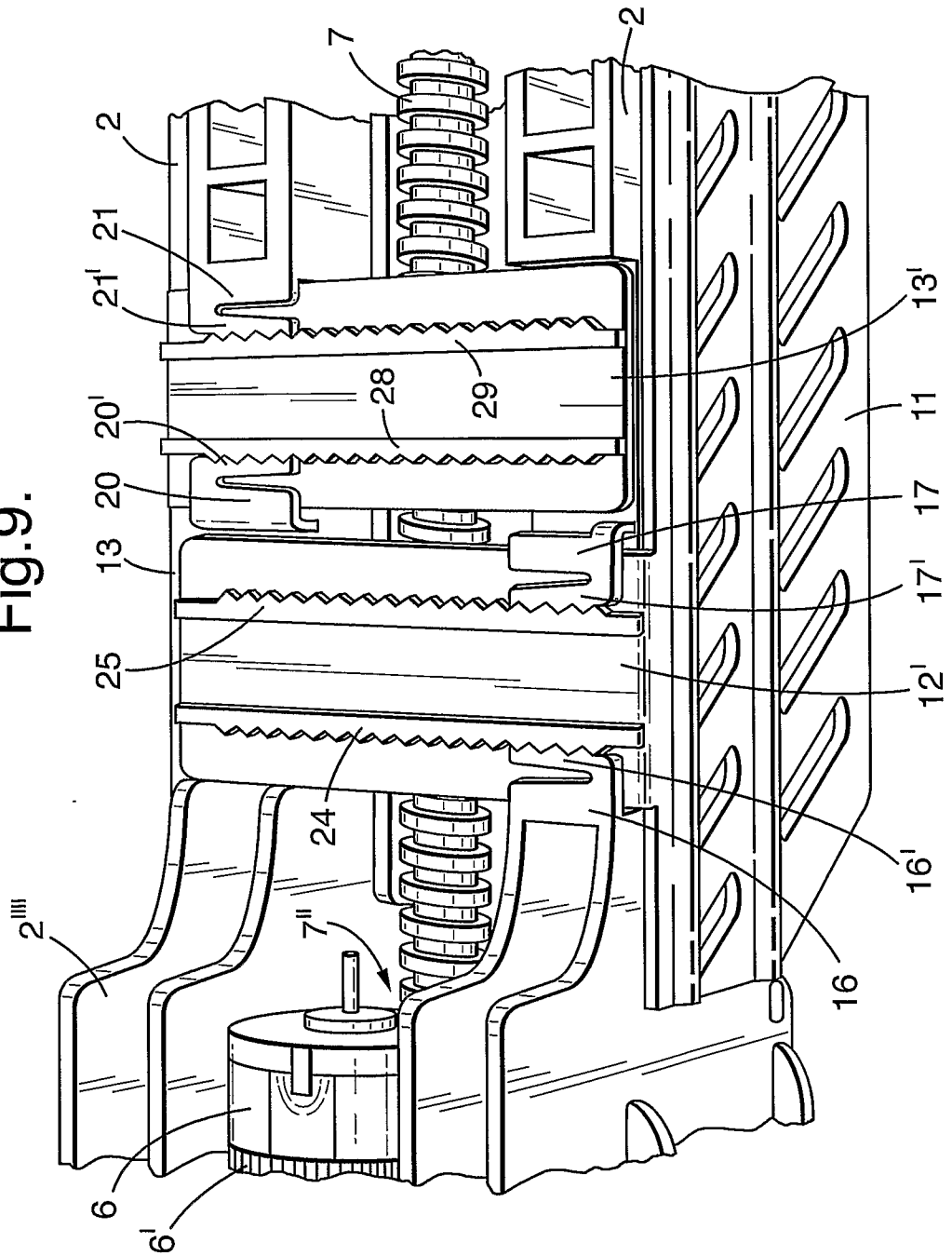


Fig.10.

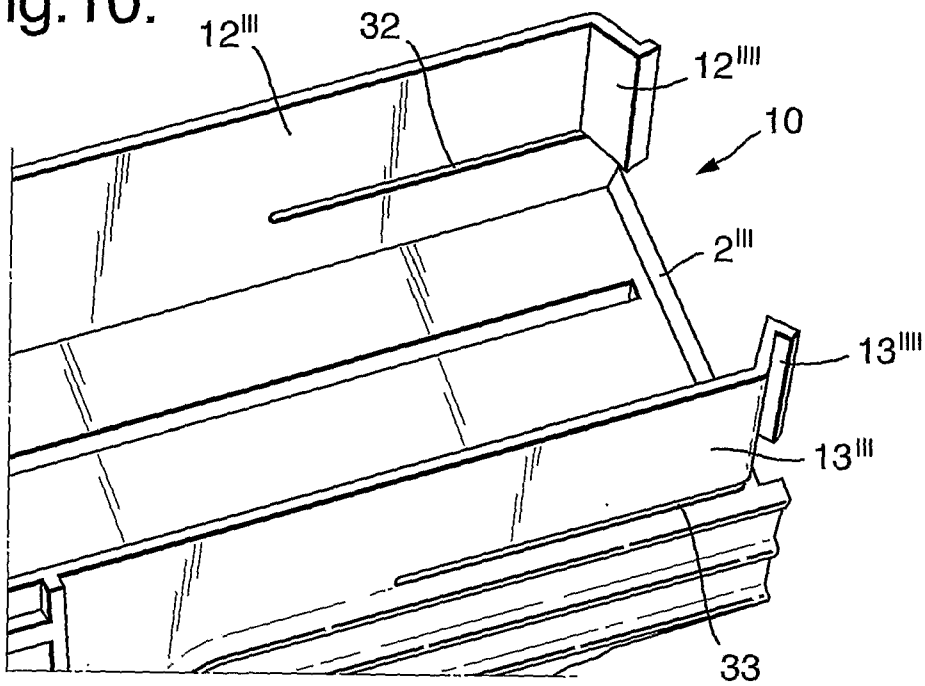
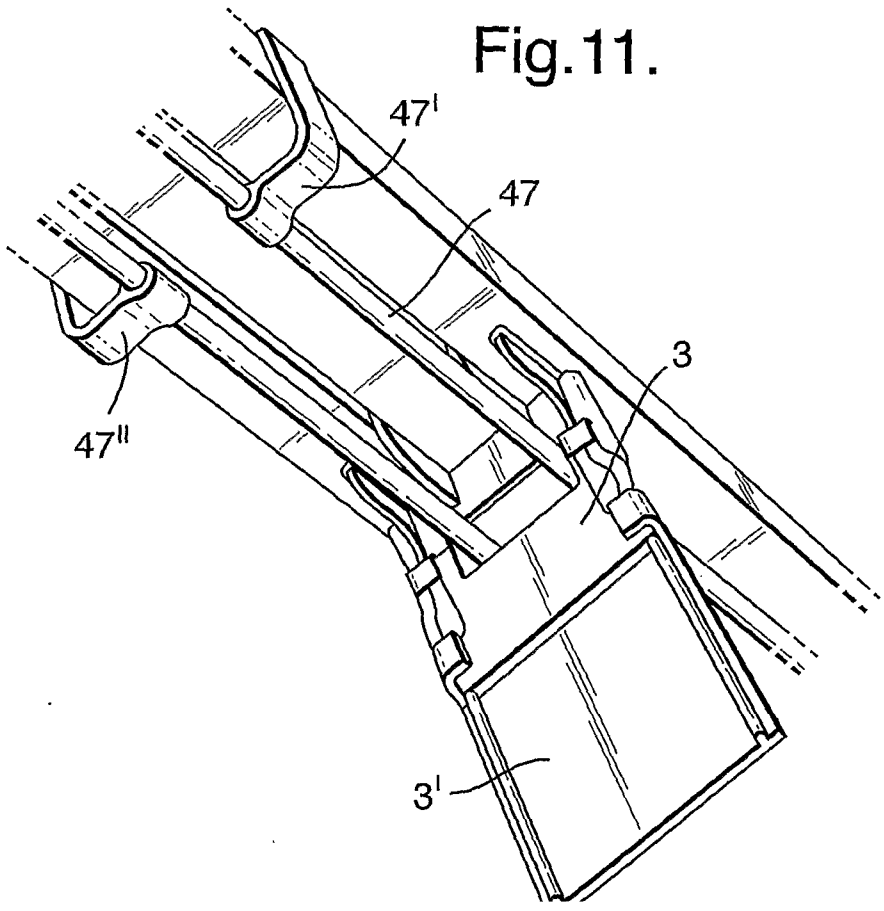


Fig.11.



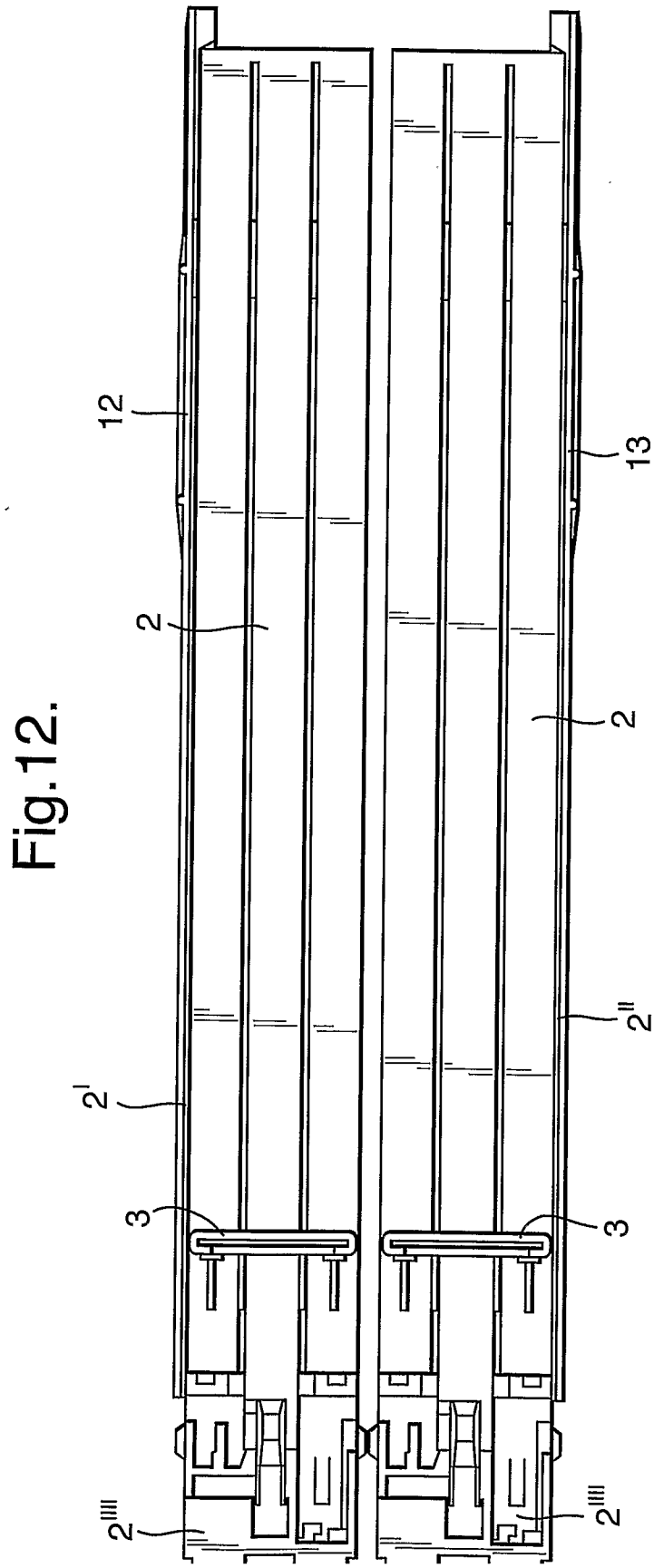


Fig.12.

Fig.13.

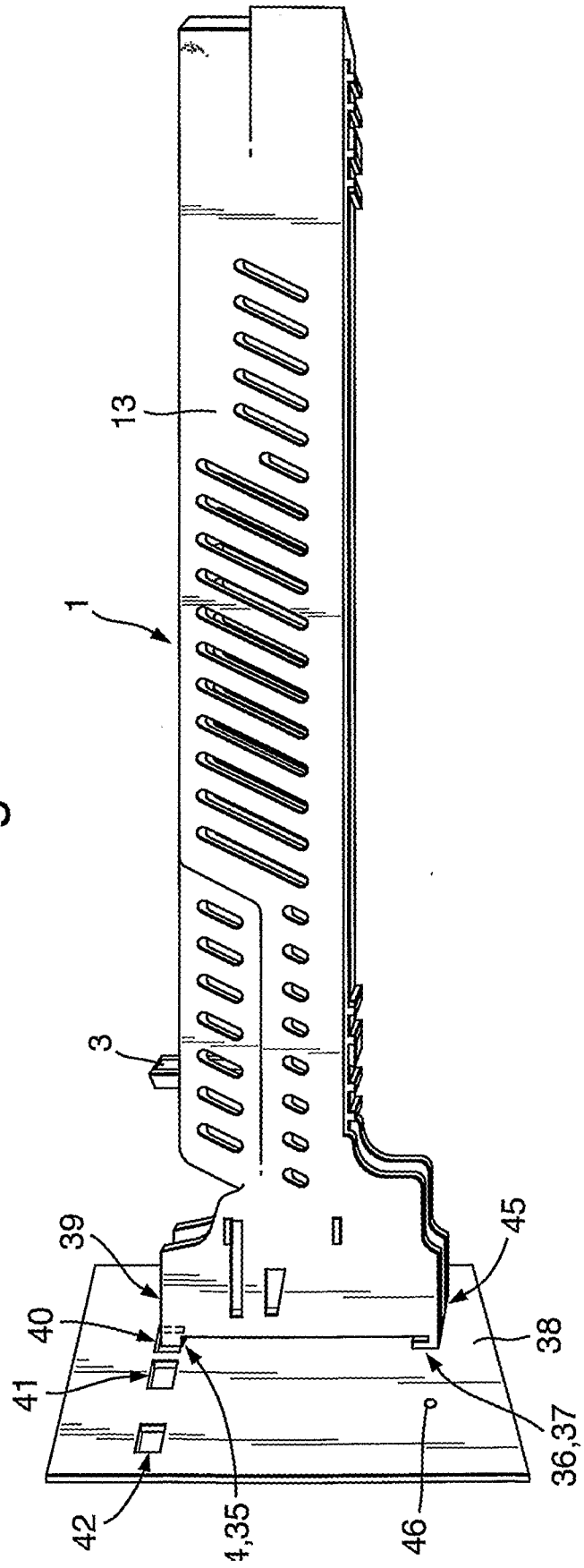
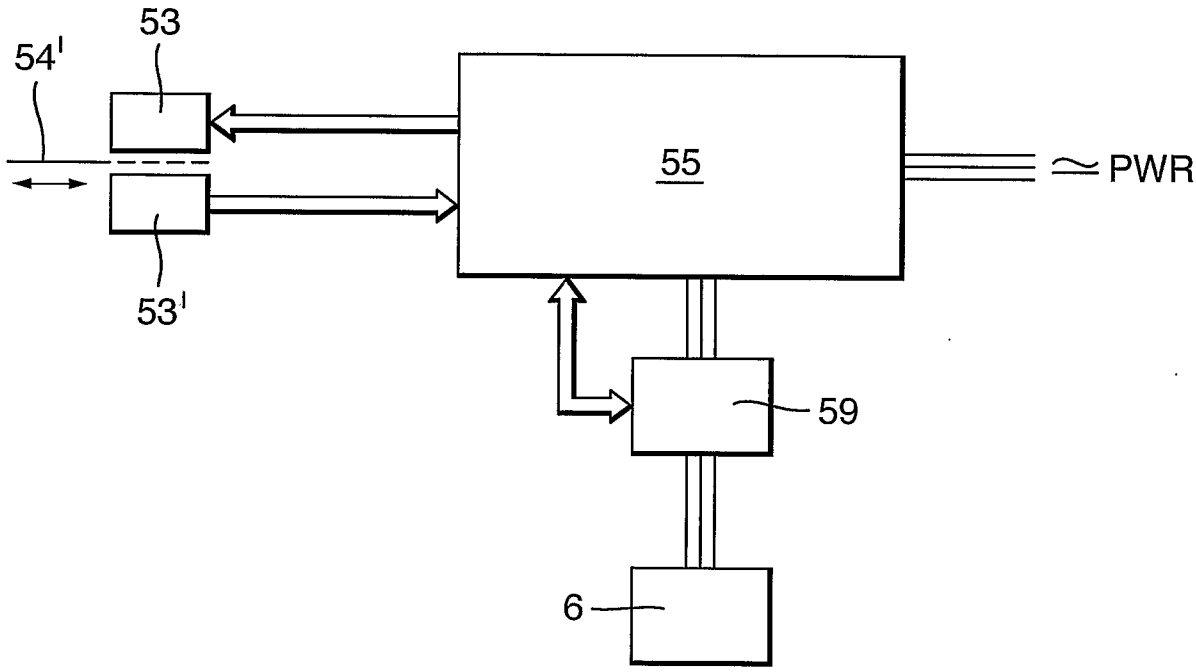


Fig.14.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/NO2007/000037

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: G07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6604652 B1 (TRAUTWEIN, H-H), 12 August 2003 (12.08.2003), column 1, line 62 - line 67, figure 1, abstract	1,4-6
A	--	2-3,7-18
Y	WO 3074396 A1 (MALDONADO, A), 12 Sept 2003 (12.09.2003), page 3, line 5 - line 7, abstract	1,4-6
	--	
Y	EP 0258954 A2 (FAWN ENGINEERING CORP), 9 March 1988 (09.03.1988), abstract	1,4-6
	--	

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 June 2008	25 -06- 2008
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Patrik Rydman /LR Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NO2007/000037

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The following separate inventions were identified:

1: Claims 1, 4-18 directed to a device with adjustable walls.

2: Claims 2-3 directed to a device that can be used in two different positions for dispensing articles.

.../...

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

Box III

The applicant is not invited to pay an additional fee since all of the claims could be searched without effort justifying such an additional fee.

The present application has been considered to contain 2 inventions which are not linked such that they form a single general inventive concept, as required by Rule 13 PCT for the following reasons:

The closest prior art has been identified as
D1: US 6604652 B1.

Document D1 describes a vending machine for distribution of cigarettes. The vending machine comprises a housing wherein several shafts are located. An optional controllable drive mechanism is allocated to each shaft (abstract, figure 1). The drive mechanism for each cigarette shaft includes preferably one electrical drive motor, as well as drive mean for transmission of a drive force to a spindle or threaded rod provided below the cigarette shaft, wherein the drive means can comprise a gear drive (column 1 rows 62-67).

Invention 1:

From a comparison of the disclosure of D1 and the technical features of claims 1 and 4-18, the following technical features can be seen to make a contribution over this prior art:

The device according to claim 1 in the application has walls that are adjustable for adaptation.

This feature is hence considered as special technical feature in the sense of Rule 13.2 PCT.

The effect of this feature is that the support piece can be used for articles independent of their width.

Invention 2:

From a comparison of the disclosure of D1 and the technical features of claims 2-3, the following technical features can be seen to make a contribution over this prior art:

.../...

Box III

The device according to claim 2 in the application is designed to be used in two different positons. In the first position the support piece is designed to form the bottom of the transport path and in the second position the support piece is designed to have mounted thereon an elongate support rail or loop.

This feature is hence considered as special technical feature in the sense of Rule 13.2 PCT.

The effect of this feature is that the support piece can be used for articles both with and without package.

The above analysis shows that the special technical features of invention 1 (claims 1, 4-18) are neither the same as, nor correspond to, those of invention 2 (claims 2-3).

Therefore, in conclusion, the 2 groups of claims are not linked by the same or corresponding special technical features and define different inventions not linked by a single general inventive concept.

Hence, the application does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

International patent classification (IPC)
G07F 11/42 (2006.01)

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- e-tjänster/anförda dokument (service in Swedish).

Use the application number as username.
The password is **YYAPCEYYXJ.**

Paper copies can be ordered at a cost of 50 SEK per copy from PRV InterPat (telephone number 08-782 28 85).

Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT
Information on patent family members

01/09/2007

International application No.
PCT/NO2007/000037

US	6604652	B1	12/08/2003	DE	19846791	A	13/04/2000
				DE	59908767	D	00/00/0000
				EP	1119830	A,B	01/08/2001
				WO	0022584	A	20/04/2000
WO	3074396	A1	12/09/2003	NONE			
EP	0258954	A2	09/03/1988	JP	63056795	A	11/03/1988
				US	4757915	A	19/07/1988