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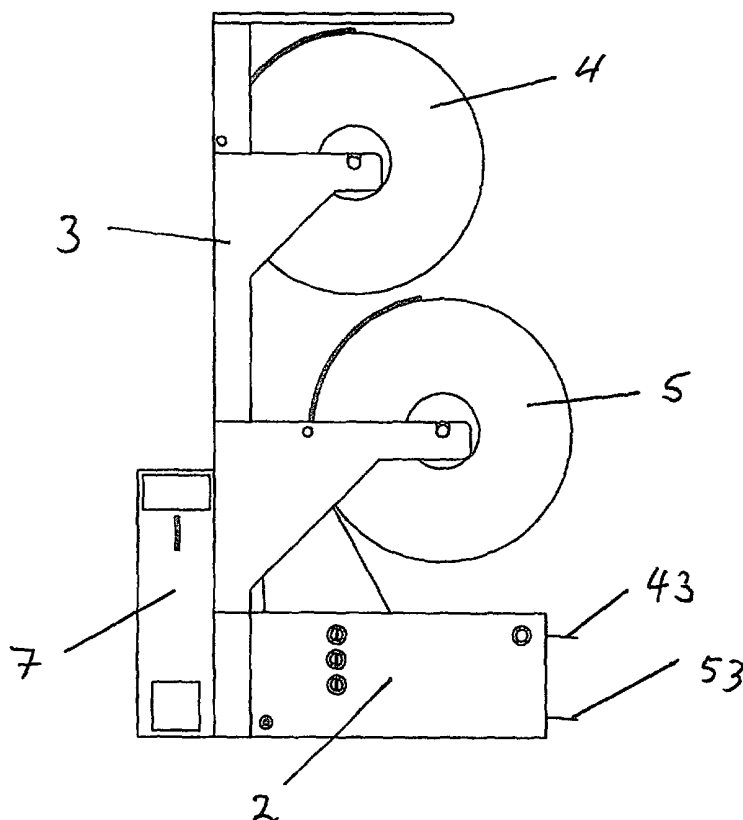
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(54) Title: DISPENSER FOR THE AUTOMATED FORWARD FEED AND CUTTING OF A SHEET MATERIAL, PREFER-  
ABLY PAPER OR THE LIKE



(57) Abstract: There is described a device for the power-operated forward feed of a sheet material, preferably paper or the like, where one or more rolls of material (4, 5) are arranged in a stand (3) placed on a casing (2) housing power supply (13) and an electric motor (16), wherein actuation of the motor causes the forward feed of the material before it is cut off by means of a cutting device, and where there is provided a printed circuit board (14) containing control circuits, and operating terminals (8-11) and/or programmable modes connected to the control circuits or control means so that the motor (16) can be set at an automated or manual maximum or unlimited permitted forward feed on one actuation.



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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Dispenser for the automated forward feed and cutting of a sheet material, preferably paper or the like**

The invention relates to a dispenser for the power-operated forward feed of a sheet material in the form of paper or the like, especially for the purpose of wrapping, where a material roll is arranged in a stand placed on a casing housing power supply and an electric motor, actuation of the motor causing the forward feed of the material before it is cut off by means of a cutting device, means being provided for selecting the desired length to be cut off, which means include a mechanism that is controlled electronically, and a control terminal and a coin machine, as disclosed in the preamble of independent claim 1.

Wrapping paper is usually supplied on rolls that are arranged in a stand. On use, the desired length of paper is pulled forward and then cut off by using of a suitable knife or tearing arrangement. The paper rolls are as a rule arranged above one another in such a way that papers of different types and breadths are available. Traditionally, such paper roll stands were placed on the shop counter or other suitable place for use by the shop assistants. However, as an efficiency measure, many shops have done away with the wrapping services provided by staff and instead offer the customer access to free wrapping paper on the principle of self service. This has often led to an overuse of paper, which means increased expenses and in its most extreme consequence may also have an adverse impact on the environment.

In, e.g., florist shops there is a need for several types of wrapping paper. For the staff it is therefore of major importance for their working environment that these wrapping papers are readily available and easy to procure in the right length or size.

There is thus a need for a dispenser for simple and rapid supply of wrapping paper in the right length and quantity. There is also a need for the paper to be supplied without the possibility of unauthorised appropriation of extra paper.

WO 97/03422 discloses an automatic paper dispensing machine of the type mentioned in the introduction. The document describes an apparatus for the automatic forward feed and supply of a desired length of wrapping paper. The length can be selected from an operating device that can be controlled by the insertion of a coin. Equipment that controls an electric motor and a cutting device is described. The apparatus is intended

to supply the paper ready rolled-up and the patent application is specifically directed towards the devices for performing the rolling up.

DE Patent 3,615,033 describes an apparatus for the automatic dispensing of curtain  
5 lengths. The dispensing and cutting of pre-selected lengths of the material is controlled by digital control means. The patent is especially directed towards solving problems relating to correct measurement of curtain lengths, and control means for this purpose are described. These are not considered particularly relevant to paper dispensing machines of the same type as the dispenser according to the present invention.

10 Furthermore, US Patent 3,276,706 discloses a power-operated dispenser for dispensing paper from rolls. The rolls are arranged above one another in a support structure and an electric motor drives drive belts for selectively feeding the paper. The document teaches three rolls above one another and selection of paper is made by using push bars  
15 that bring the relevant drive belt into engagement with the selected paper for the forward feed thereof. The push bar is held in until the relevant length of paper has been dispensed. The US device is primarily intended for home use and even though it probably works extremely well, it is not suitable for solving the problems that are the basis of the present invention.

20 Thus, the invention relates to a dispenser of the aforementioned type that meets a long-felt need, which the prior art in the field has not been able to meet in an optimal manner. This is achieved in that the dispenser is designed to have the characterising features as disclosed in the characterising clause of patent claim 1.

25 Advantageous embodiments of the invention are set forth in the dependent patent claims.

The invention will now be described with reference to the drawings, wherein:

30 Fig. 1 is a front view of a dispenser according to the invention;

Figs. 2A-B are side views of the dispenser;

35 Fig. 3 is a schematic cutaway side view of part of the dispenser, in partial section;

Fig. 4 is view corresponding to Fig. 3, seen from above; and

Fig. 5 shows a plate having openings for paper and an arrangement of cutting blades.

5

The apparatus according to the invention, which may be called a paper dispenser or automatic paper machine, is generally indicated by means of the reference numeral 1. It is primarily intended for mounting on a horizontal table or counter and comprises a casing portion 2 and a preferably adjustable stand portion 3. The machine 1 can in a suitable manner be rendered pilfer-proof. Rolls of the sheet material that is to be delivered and cut are arranged in the stand portion 3. The illustrated embodiment shows two rolls of paper 4 and 5 of different width arranged on supports 6 that are in turn mounted in the stand 3. In addition to having different widths, the rolls 4 and 5 can of course be completely different types of paper, for example, grey wrapping paper, gift wrapping paper, cellophane etc. A coin machine 7 may be provided in connection with the casing 2. Various operating terminals such as key switches/multimode terminal may be mounted in the casing wall, as indicated schematically in Figs. 2A and 2B. These may, for example, be a socket outlet 8 for the remote control of the cutting operation, e.g., by using a foot pedal, a key switch 9 for detaching/attaching the coin machine 7, a key switch 10 for overriding the coin machine 7, a key switch 11 for the manual feed of paper and a push button 12 for the cutting of paper.

Inside the casing 2 is arranged a power supply 13, a printed circuit board 14, and in the illustrated embodiment two step motors 16 or the like for paper feed. The motors 16 are mounted on respective frames 15. The motor frame 15 is pivotally mounted on a shaft 20. The motor 16 is equipped with a driving roller 17 for driving an auxiliary roller which in turn cooperates with a pressure roller 19 that is also mounted on the frame 15. In a preferred embodiment, the driving roller 17 is a toothed wheel and the auxiliary roller 18 has an cooperating toothed rim or the like mounted thereon. The frame 15 or the support of the roller 19 is equipped with a projection 29 for activation of a switch 21 that is fixed in the housing 2 for supplying power to the motor 16. The switch 21 is preferably of the type that registers and responds to the length of time for which the operating button is depressed. The activation of the switch 21 can also take place in other suitable ways. The essential point is that the tensioning or pulling down of the paper or sheet helps to determine how long the switch button or similar is depressed.

35

In Fig. 3 for the sake of clarity only one motor arrangement is shown, namely for the upper paper feed, but a similar arrangement is also provided for the lower feed. The motor arrangement can also be mounted differently, or optionally fixed without mounting on the shaft 20, but in that case it must have another sensor system.

5

Two guides 41 and 51 are arranged in the casing 2 for the forward feed or dispensing of paper from the rolls 4 and 5. There is also provided a plate wall 23 with two rectangular, horizontal slots that interact with cutting blades or knives 24. The wall 23 may optionally be slightly conical in shape, so that the knives 24 are self-sharpening. In the illustrated embodiment, two electromagnets 25 of the type that have a two-way electromagnetic arm 28 are provided. The cutting blades or knives 24 are connected by means of an articulated member 26 in which hole 27 is provided for a pin-shaped end of the arm 28, see Figures 3 and 5.

15 Lastly, located inside the casing 2 is an end piece 22 equipped with paper guides 42 and 52 respectively and associated slots for dispensing paper. The mechanisms for paper feed and cutting are, for example, mounted together in a unit arranged in the casing 2 before the end piece 22 is put in place.

20 The power supply 13 includes a transformer for mains voltage 115/230V, and rectifiers and associated smoothing circuits etc. so that a suitable direct-current voltage, e.g., 24V, can be supplied to the electronic components and the other equipment that is to be operated. The printed circuit board 14 is so configured that it comprises the necessary electronic circuits for providing the desired control functions, i.e., motor control for delivering measured, purchased or in some other way determined length of paper,  
25 control of the motor drive and control of the electromagnets 25 for cutting the paper etc.

Before the machine is put into service, the paper roll or rolls must be installed and the paper arranged in the guides 41 and/or 51, and moved forward by the motor 16 so that  
30 the paper is in place between the auxiliary roller 18 and the pressure roller 19 and the paper extends a suitable length beyond this area. When the machine is then actuated, either by using the coin machine, or by overriding it, the paper end or ends 43 and/or 53 will automatically be guided forwards so that it or they project some centimetres from the slot or slots in the end piece 22. When there is a pulling effect on the paper because  
35 someone pulls on the end of the paper, the whole frame 15 will turn on its shaft 20 and the projection 29 will come into contact with the switch 21 which in turn actuates power supply to the motor 16 and subsequent rotation of the driving roller 17. The roller 17 in

turn drives the auxiliary roller 18 which together with the pressure roller 19 provides forward feed of the paper and the delivery thereof through the slot in the end piece 22.

To obtain a continuous paper flow, there must always be a certain pulling effect on the paper. If the pulling effect is increased, this will be registered in the switch 21 or by a suitable sensor device that reacts to the turning of the frame 15, and the power supply to the motor will be controlled so that the motor 16 increases speed and the paper feed rate increases. When the pulling force ceases, the switch 21 will be turned off, the motor 16 will die and the paper flow will come to a stop. When the dispenser/machine is used without a coin machine, all the sheet materials will at any given time be in position, ready for forward feed, and after cutting they will come forward into position again.

The paper the user pulls on will be the paper he buys or selects. The other paper is immediately retracted into the apparatus 1. If the user chooses to cut the paper before the purchased length has been reached, both papers will come forward, thus allowing the user to select once more which paper he wants. Alternatively, the machine can be so configured that when a coin is inserted, only one length of paper can be bought, but the user can, of course, select paper as disclosed above.

The actuation of the cutting mechanism can take place in many ways. For example, it can be triggered automatically when the purchased/measured paper length has been dispensed or when the pull on the paper ceases. It can be actuated by means of the key switch 11 or the push button 12 etc. Means are provided to ensure that the cutting mechanism always knows which paper is to be cut.

The actual cutting mechanism works so that when, for example, the uppermost paper is to be cut, the electromagnets 25 are activated, one before the other, and by means of the arms 28 coupled to the articulated members 26, the upper cutting blade 24 is caused to move upwards. Since the activation of the two electromagnets 25 is time-staggered, the result will be a cutting movement of the cutting blade 24 as if cutting the paper with a pair of scissors. When the lowermost paper is cut, a similar sequence takes place, but now with the lowermost knife 24 as the active cutting element in a downward movement. Other cutting arrangements are also possible, e.g., laser, wires etc.

The apparatus according to the invention can be provided with or without the coin machine 7. The first variant is intended for customers who buy wrapping paper by inserting a coin. The second variant is primarily intended for the shop staff who wrap items. Both variants are manufactured in the same way and the only difference is the

connection of the coin machine 7. This is constructed in a conventional manner with slots for the insertion of coins and a return pocket for invalid/rejected coins. It is also preferably equipped with a display that shows the length or number of sheets of paper due. It should be possible to configure it for different currencies, and similarly it should  
5 be possible to choose the length unit, e.g., metres or feet. There must be a corresponding relation between the paper lengths present at any given time on the rolls 4, 5 and the length of paper that can be sold at the same time. Data concerning the length of paper on a new roll installed in the machine can be entered in a suitable  
10 manner in a control device, preferably the printed circuit board 14, which is connected to the measuring device or a counter and which is set at zero when the paper roll is changed.

P a t e n t   c l a i m s

1.

A dispenser for the power-operated forward feed of a sheet material in the form of paper  
5 or the like, especially for wrapping purposes, where a roll of material (4, 5) is arranged  
on a stand (3), placed on a casing (2) housing power supply (13) and an electric motor  
(16), wherein actuation of the motor (16) causes the forward feed of the material before  
it is cut off by means of a cutting device, means being provided for selecting the desired  
length that is to be cut off, which means include a mechanism that is controlled  
10 electronically, and also an operating terminal (8-11) and a coin machine (7),  
characterised in that the motor (16) is arranged on a frame (15) which is pivotally  
supported on a shaft (20), and drives associated rollers (17, 18, 19), and on the frame  
(15), or in connection with the support of the pressure roller (19) which is also mounted  
on the frame (15), there is provided a projection (29), and where tension in the sheet  
15 material downstream of the point at which the forward feed power of the motor (16) is  
applied to the sheet will cause a turning of the frame (15) and the projection (29),  
thereby causing the projection (29) to operate a switch (21) that is arranged in the casing  
(2), so that the switch (21) applies power to the motor (16) and actuates it.

20 2.

A dispenser according to claim 1, characterised in that the switch (21) is of a pull sensor  
type that registers and responds to how long the operating button is depressed by the  
projection (29), so that the power supply to the motor (16) can be controlled.

25 3.

A dispenser according to one of claims 1-2, characterised in that the cutting device  
consists of a mechanism comprising a plate wall (23) shaped having at least one  
rectangular slot that interacts with a cutting blade (24) or the like, for example, laser,  
wire, chain-driven cutting blades, and there is provided an electromagnet (25) having an  
30 arm (28) connected to the cutting blade (24) by means of an articulated member (26)  
equipped with hole (27) or the like so that the cutting blade (24) or the corresponding  
device by means of the electromagnet (25) can be moved across the slot in the plate wall  
(23).

35 4.

A dispenser according to claim 3, characterised in that the plate wall (23) is made  
having one or more slots, and where there is arranged at least one cutting blade (24)

which at its respective ends is connected by means of the articulated members (26) and two electromagnets (25) of the two-way type so that the arm (28) of the respective electromagnets (25) can be moved, staggered both in time and in direction, and a cutting movement of the cutting blade or knife or knives (24) is obtained.

5

5.

A dispenser according to one of claims 1-4, characterised in that the means for selecting the desired feed length comprise a printed circuit board (14) having control circuits, and/or programmable modes associated with the control circuits or control devices so  
10 that the motor (16) can be set at an automated or manual maximum or unlimited permitted forward feed on one actuation.

6.

A dispenser according to claim 5, characterised in that the programmable modes are  
15 programmed so that the means for controlling the feed length work both with and without a coin machine.

7.

A dispenser according to claim 5, characterised in that the operating terminals comprise  
20 a socket outlet (8) for remote control of cutting, a first key switch (9) for detaching/ attaching the coin machine (7), a second key switch (10) for overriding the coin machine (7), a third key switch (11) and optionally a push button (12) for cutting paper or sheet material, or one key can make ready all the modes and a mode for programming.

25

8.

A dispenser according to one of claims 1-7, characterised in that the motor (16) is a step motor.

30

9.

A dispenser according to one of claims 1-8, characterised in that it can be programmed or set so that the paper feed is carried out without motor assistance as the motor only causes the forward feed of new paper after cutting so that the machine is ready for new withdrawal.

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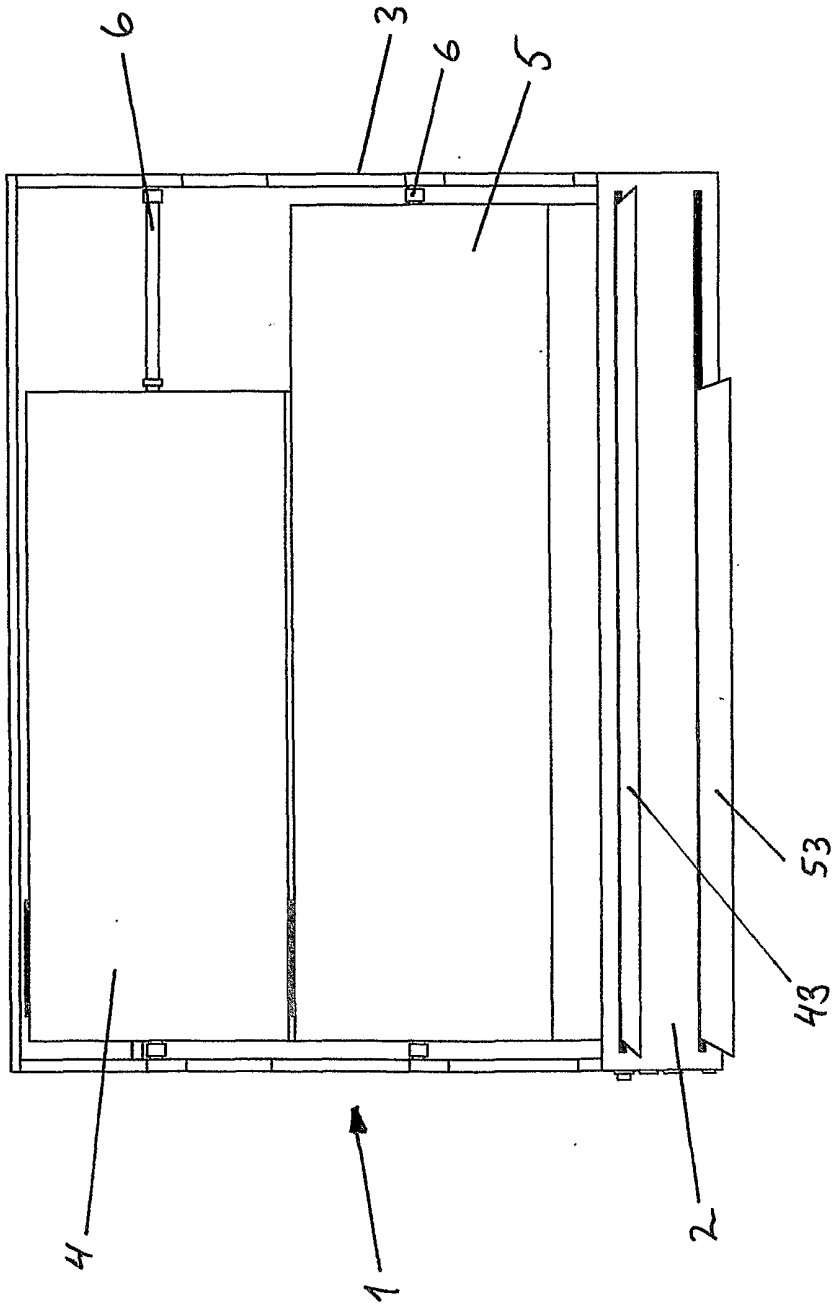


FIG. 1

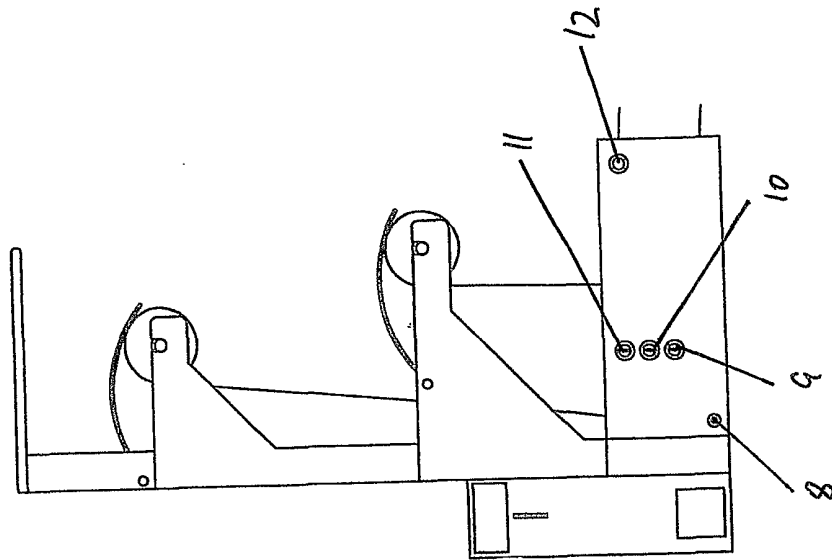


FIG. 2B

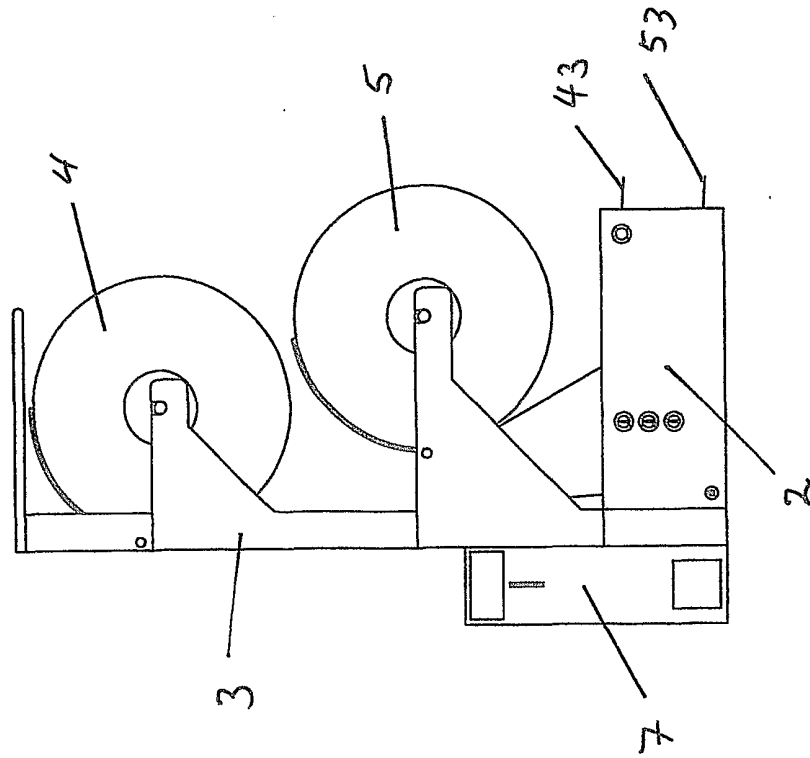


FIG. 2A

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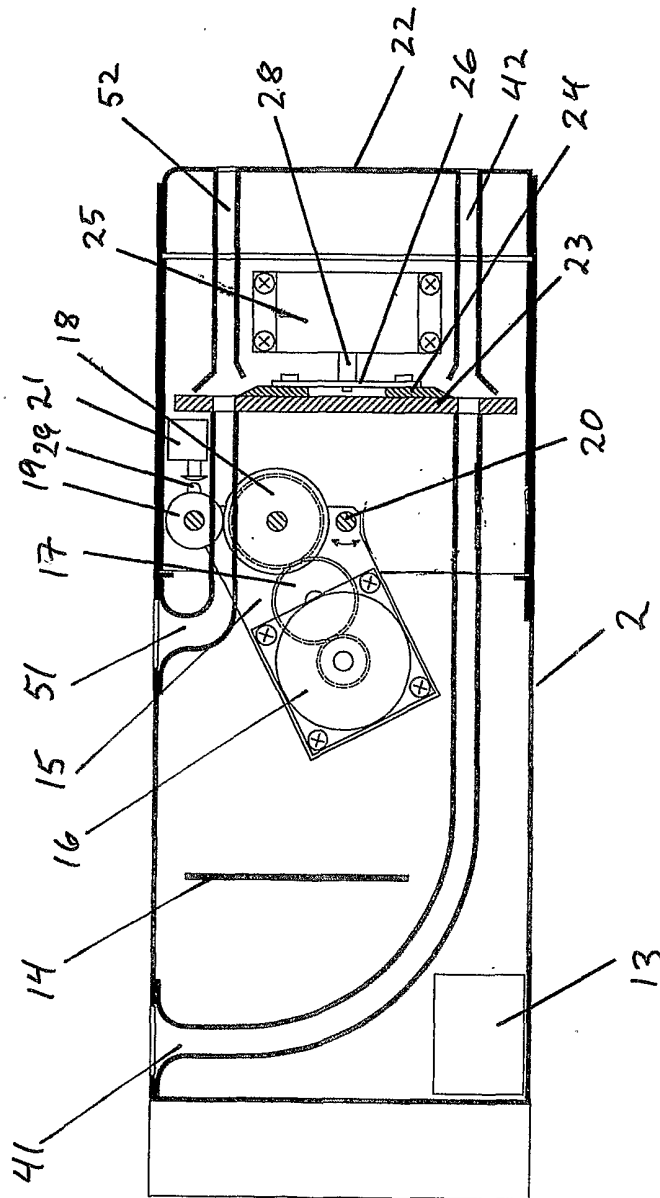


FIG. 3

4/4

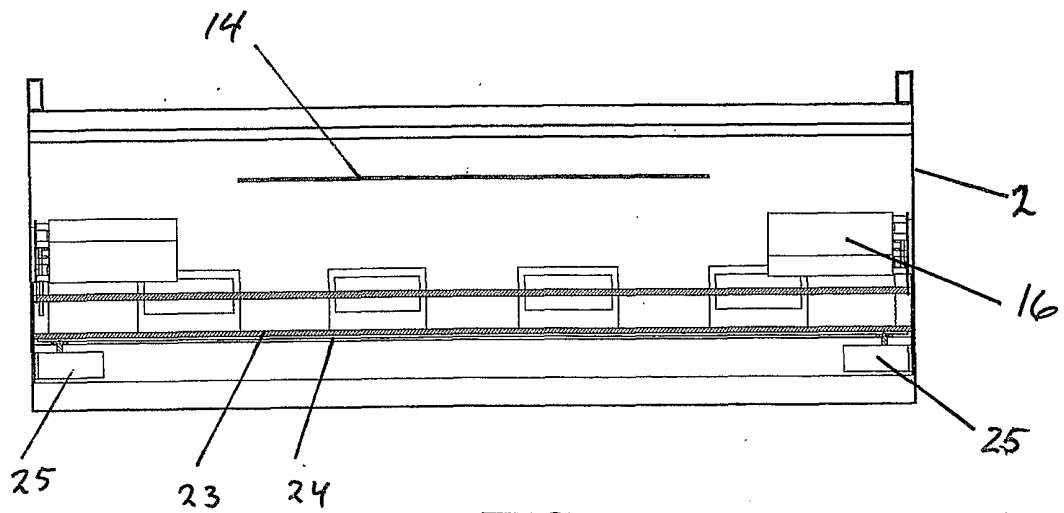


FIG. 4

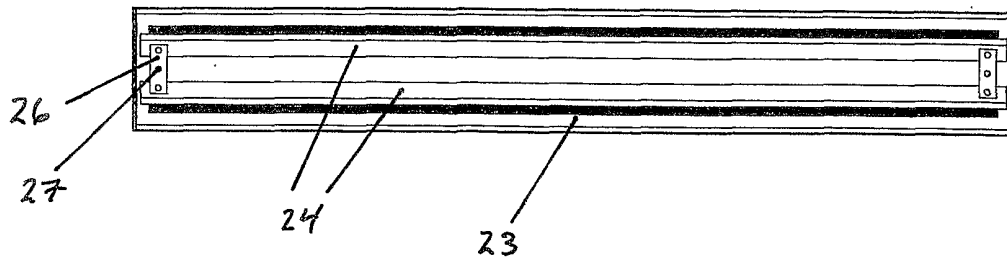


FIG. 5

## INTERNATIONAL SEARCH REPORT

International application No.

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B65H 35/00

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)

IPC7: B65H

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)

WPI-DATA, EPO INTERNAL, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9703422 A1 (FLEURY, A.), 30 January 1997 (30.01.97) --	1-9
A	US 3276706 A (L.D. HOUSE), 4 October 1966 (04.10.66) --	1
A	GB 2260636 A (ASAHI SEIKO KABUSHIKI KAISHA), 21 April 1993 (21.04.93) --	1
A	EP 0147287 A2 (GONZALES LLORENS, R. ET AL), 3 July 1985 (03.07.85) --	1

 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

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"P" document published prior to the international filing date but later than the priority date claimed

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"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

"&amp;" document member of the same patent family

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12 November 2001

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## INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4367666 A (J.E. TOTH), 11 January 1983 (11.01.83)  --	1
A	DE 3615033 A1 (IMPULS-APPARATEBAU JAEGER & SOHN GMBH), 5 November 1987 (05.11.87)  -- -----	5-8

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

01/10/01

International application No.

PCT/NO 01/00334

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9703422 A1	30/01/97	AT 185641 T AU 6410296 A BE 1009744 A CA 2227028 A DE 69604669 D,T DK 838071 T EP 0838071 A,B SE 0838071 T3 ES 2141517 T	15/10/99 10/02/97 01/07/97 30/01/97 23/11/00 17/04/00 29/04/98 16/03/00
US 3276706 A	04/10/66	NONE	
GB 2260636 A	21/04/93	GB 9220516 D JP 2565814 B JP 5112336 A KR 9514082 B US 5234093 A	00/00/00 18/12/96 07/05/93 21/11/95 10/08/93
EP 0147287 A2	03/07/85	SE 0147287 T3 AT 47763 T DE 3480362 D ES 276488 U,Y ES 530794 A ES 8503604 A	15/11/89 00/00/00 16/05/84 16/03/85 16/06/85
US 4367666 A	11/01/83	GB 2090579 A,B	14/07/82
DE 3615033 A1	05/11/87	NONE	