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(54) Gumming method

(57) A gumming method for applying adhesive material (3) to given portions (4) of a support (1), e.g. a paper support, traveling at a given speed in a given direction (F); the method involving the use of applying devices (7, 8), at least one (8) of which is a "spreading" device with a nozzle (10) having an elongated-section output (12a) for the adhesive material (3); the spreading device (8) being mounted with the elongated section of the output (12a) oriented crosswise to the traveling direction (F) of the support (1) and at a relatively small distance from the support (1), and being activated for a relatively short time to coat, on the support (1), an elongated portion (4a) oriented crosswise to the traveling direction (F) of the support (1).

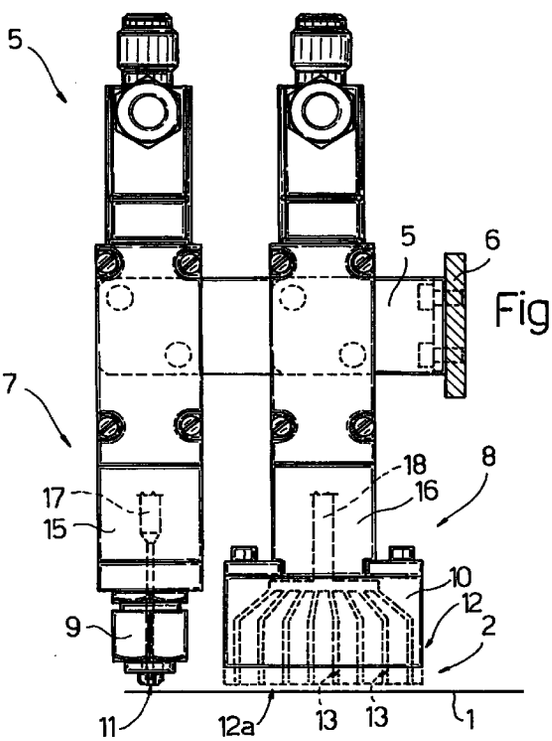

Fig.2

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Description

The present invention relates to a gumming method.

In particular, the present invention relates to a gumming method for applying adhesive material to a number of given surface portions of a support, in particular a paper support or similar.

The present invention may be used to advantage on packing machines, to which the following description refers purely by way of example.

Packing machines require the application of adhesive material to given portions of sheets, e.g. sheets or blanks of wrapping material, which are folded into containers and must be stabilized in the folded position, or to given portions of sheets comprising, for example, labels or revenue stamps, which are simply connected to a support comprising, for example, a paper support.

From European Patent Application n. 601,411, in particular, packing machines are known to feature a gumming unit located along the path of the sheets to be gummed, and comprising gumming devices in the form of spray guns with nozzles for applying adhesive material to given gumming portions of each sheet.

In general, the above known unit is unsuitable for forming on the sheets substantially continuous gummed strips crosswise to and of relatively small size in the traveling direction of the sheets. That is, on account of the transverse dimensions of the spray guns, it is substantially impossible to align the nozzles of the spray guns in a direction crosswise to the traveling direction of the sheets, and position the nozzles close enough to one another to obtain a substantially continuous gummed strip of relatively large transverse dimensions. It is always possible, of course, to obtain a continuous transverse strip by increasing the distance between the gumming unit and the sheets so as to increase the section of the spray emitted by each nozzle and impinging on the sheets. In this case, however, the transverse dimensions of the strip are invariably unacceptable.

To eliminate the above drawback, gumming devices of the above type are known to be offset with respect to one another both in the traveling direction of the sheets and in a direction perpendicular to the traveling direction, so that the distance, measured crosswise to the traveling direction of the sheets, between the material sprayed on to the sheets by the various nozzles is independent of the transverse dimensions of the gumming devices. Such a method, however, requires the use of a large number of gumming devices, and relatively complex, high-cost control systems for sequentially controlling the gumming devices in time with the travel of the sheets to be gummed.

It is an object of the present invention to provide a gumming method designed to overcome the aforementioned drawbacks.

According to the present invention, there is provided a gumming method for applying adhesive material to a number of given surface portions of a support, in particular a paper support or similar, traveling at a given speed in a given traveling direction, at least a first of said portions being an elongated portion extending perpendicularly to said traveling direction; the method involving the use of devices for applying adhesive material, and each comprising a respective nozzle for emitting a respective given quantity of adhesive material in time with the passage, past the nozzle, of a respective said given portion of said support; and at least a first of said nozzles comprising an elongated output; characterized in that said first nozzle is positioned with said elongated output perpendicular to said traveling direction and along a path of said first portion, and is activated for a relatively short time to coat the first portion.

According to a preferred embodiment of the above method, said output is defined by an end outlet of said first nozzle; said outlet being located at such a distance from said support as to interfere with the adhesive material deposited on the support by said first nozzle, and to spread the adhesive material on said first portion.

Moreover, the above method preferably involves the use of relatively pasty adhesive material.

A number of non-limiting embodiments of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic side view, with parts in section, parts removed for clarity, and parts in block form, of a gumming unit implementing the method according to the present invention;

Figure 2 shows, with parts removed for clarity, a detail in Figure 1;

Figure 3 shows, with parts removed for clarity, a variation of the Figure 2 embodiment;

Figures 4 and 5 show plan views of two blanks, which may be gummed using the unit shown in any one of the above drawings.

Number 1 in Figure 1 indicates a sheet - e.g. a semi-rigid blank 1a (Figure 4) from which to form rigid hinged-lid packets of cigarettes; or a soft blank 1b of wrapping material for packets or cartons of cigarettes; or a label or revenue stamp (not shown) for application to a support, e.g. of paper material - which is fed by known means (not shown) in a direction F and along a path P, one portion of which extends through a gumming station 2 where portions of sheet 1 (Figures 4 and 5) are coated with adhesive material 3.

As shown in Figures 4 and 5, both blanks 1a and 1b are substantially in the form of an elongated rectangle, and comprise, on one surface, a number of gumming portions 4 also normally in the form of an elongated rectangle. More specifically, each blank 1a, 1b comprises portions 4a and 4b respectively parallel and crosswise to a respective longitudinal axis (not shown).

By way of example in the following description, blanks 1a and 1b will be assumed to be fed in a direction F crosswise to their longitudinal axis, i.e. crosswise to

respective portions 4a.

Sheet 1 is gummed by a gumming unit 5 located at station 2, and comprising a frame 6 fitted in a fixed position to a supporting wall and in turn fitted with applying devices 7 and 8 comprising respective nozzles 9 and 10 maintained facing path P. In the example shown, nozzle 9 comprises one hole 11 for applying material 3; and applying device 8 is of the type marketed, for example, by ITW DYNATEC by the name of "DYNA COLD 3", the nozzle 10 of which comprises an end outlet 12 having an elongated output 12a defined, in the Figure 2 embodiment, by a number of aligned holes 13, or, as shown in Figure 3, by an elongated opening 14.

As shown in Figures 2 and 3, applying device 8 is mounted along the path traveled by a respective portion 4a as sheet 1 is fed in direction F along path P, and is positioned with outlet 12 substantially contacting path P, and with elongated output 12a oriented crosswise to direction F.

Applying devices 7 and 8 comprise respective hollow bodies 15 and 16 housing in known manner respective known valve elements 17 and 18 connecting respective nozzles 9 and 10 to a hydraulic circuit 19 forming part of unit 5. Circuit 19 comprises a tank 20 for a given quantity of adhesive material 3; a supply pump 21; a supply conduit 22 extending from tank 20 to hollow bodies 15 and 16 and through pump 21; and a control device 23. Device 23 in turn comprises a central control unit 24; a sensor 25 connected to central control unit 24 to detect the passage of sheet 1 at a detection point immediately downstream from station 2 in direction F; and a transmitter 26, normally an encoder, connected to and for supplying central control unit 24 with data relative to the movement of sheet 1 along path P.

Central control unit 24 controls opening and closing of valve elements 17 and 18 of respective applying devices 7 and 8, and is so programmed as to provide for prolonged opening of valve element 17 of applying device 7 to apply adhesive material 3 to a respective portion 4b extending parallel to traveling direction F, and for substantially instantaneous, i.e. relatively short-term, opening of valve element 18 of applying device 8 to apply adhesive material 3 to a respective portion 4a extending, as stated, crosswise to and of relatively small size in direction F.

Operation of applying devices 7 and 8 and the passage through station 2 of the respective gumming portions of sheet 1 are timed in known manner by central control unit 24 on the basis of signals received from sensor 25 and transmitter 26.

In actual use, being located a relatively small distance from path P, outlet 12 interferes with adhesive material 3 issuing from output 12a, so as to "spread" the material over respective portion 4a and so ensure substantially complete, even coverage of portion 4a.

Claims

1. A gumming method for applying adhesive material (3) to a number of given surface portions (4) of a support (1), in particular a paper support (1) or similar, traveling at a given speed in a given traveling direction (F), at least a first (4a) of said portions (4) being an elongated portion (4a) extending perpendicularly to said traveling direction (F); the method involving the use of devices (7, 8) for applying adhesive material (3), and each comprising a respective nozzle (9, 10) for emitting a respective given quantity of adhesive material (3) in time with the passage, past the nozzle (9, 10), of a respective said given portion (4) of said support (1); and at least a first (10) of said nozzles (9, 10) comprising an elongated output (12a); characterized in that said first nozzle (10) is positioned with said elongated output (12a) perpendicular to said traveling direction (F) and along a path of said first portion (4a), and is activated for a relatively short time to coat the first portion (4a).

2. A method as claimed in Claim 1, characterized in that said output (12a) is defined by an end outlet (12) of said first nozzle (10); said outlet (12) being located at such a distance from said support (1) as to interfere with the adhesive material (3) deposited on the support (1) by said first nozzle (10), and to spread the adhesive material (3) on said first portion (4a).

3. A method as claimed in Claim 1 or 2, characterized by involving the use of relatively pasty adhesive material (3).

4. A method as claimed in one of the foregoing Claims, characterized in that said output (12a) is defined by a number of aligned holes (13), which are oriented in a direction crosswise to the traveling direction (F).

5. A method as claimed in Claim 1, 2 or 3, characterized in that said output (12a) is defined by an elongated opening (14), which is oriented in a direction crosswise to the traveling direction (F).

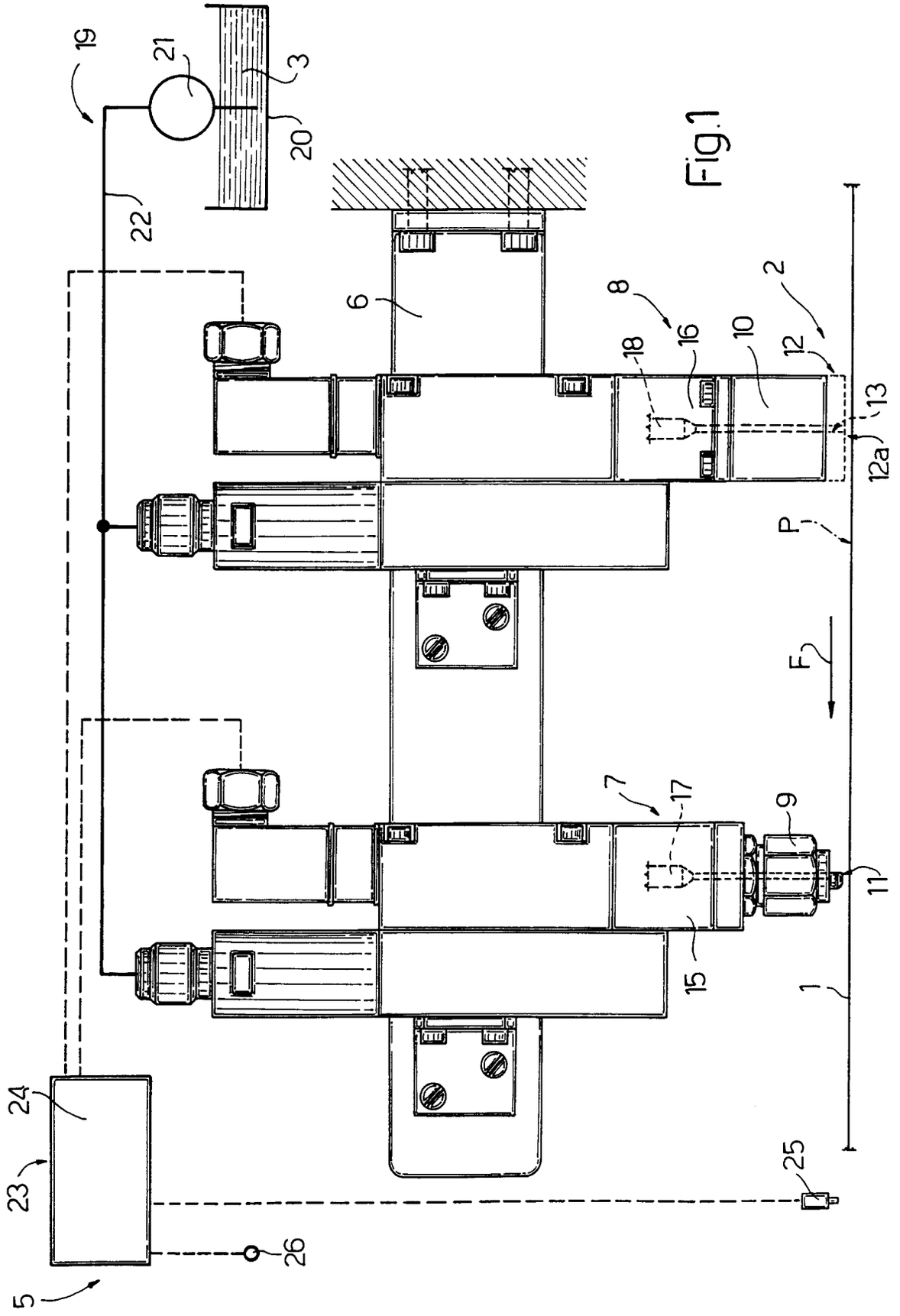


Fig.1

Fig.3

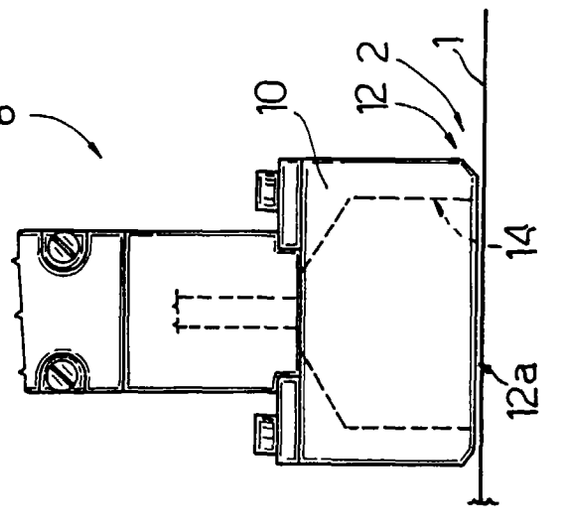
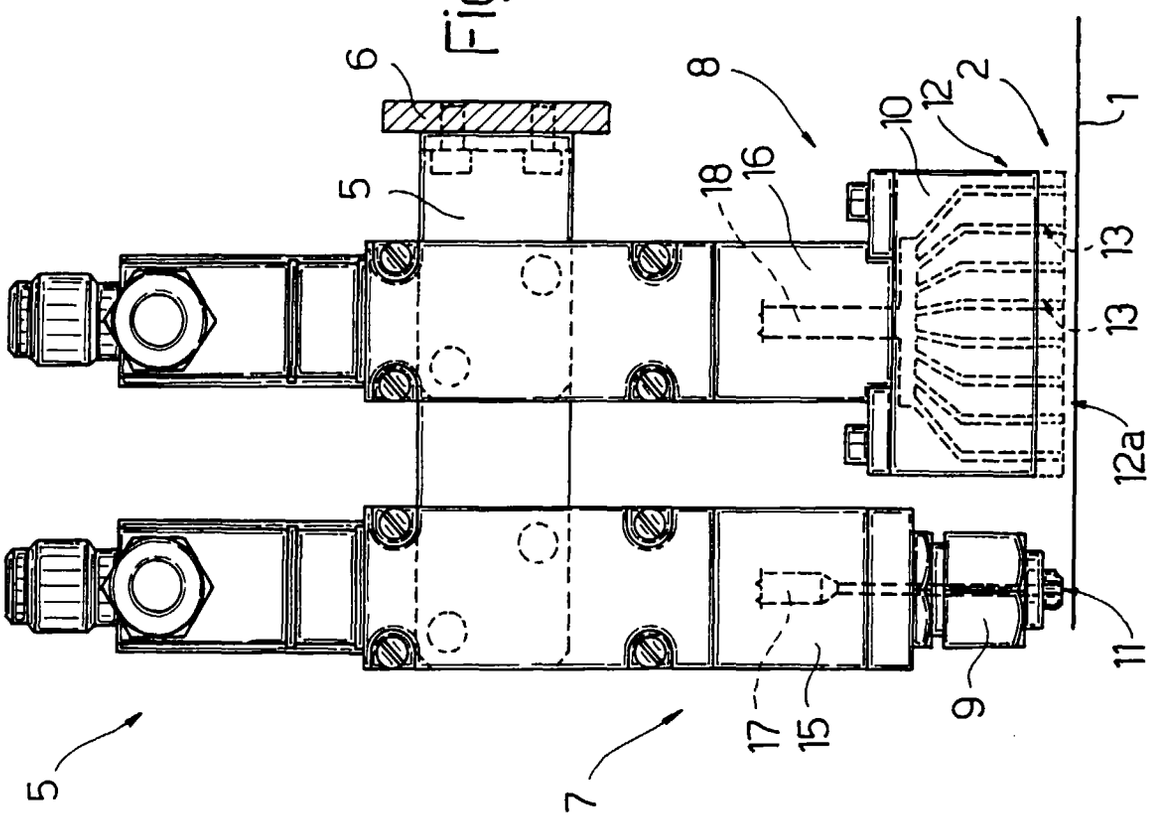


Fig.2



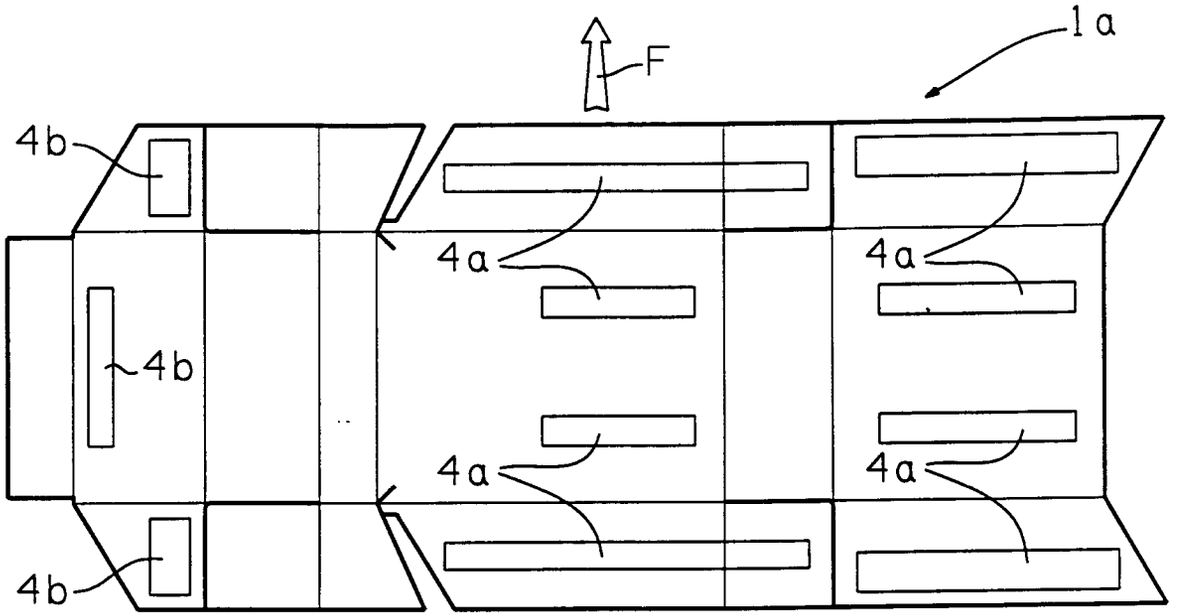


FIG.4

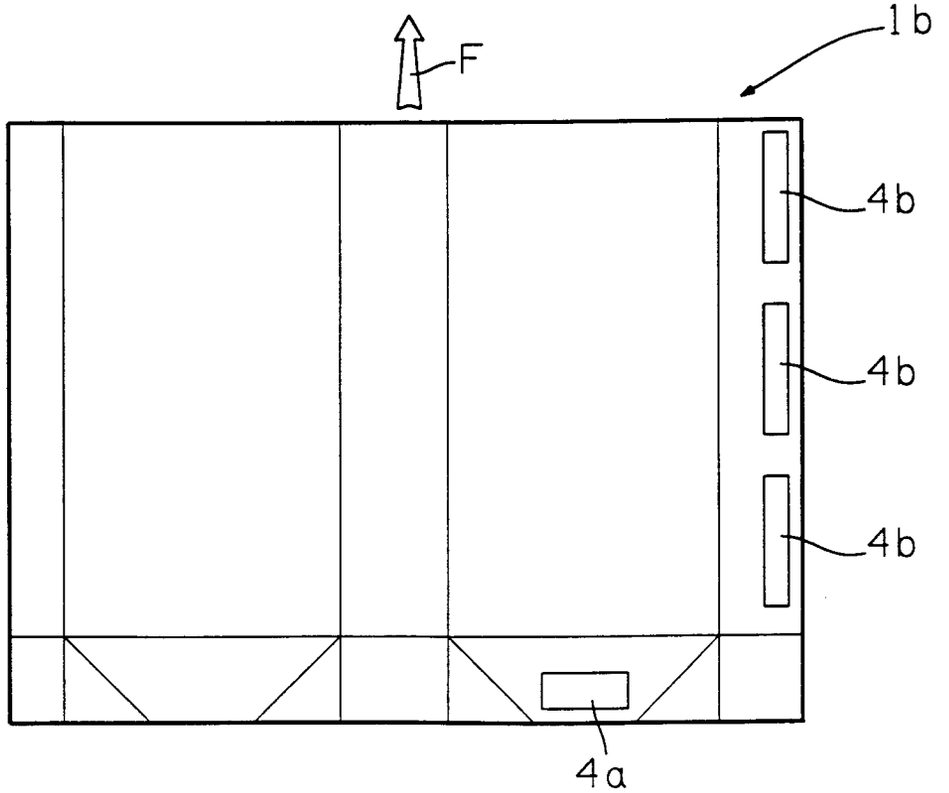


FIG.5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 10 7100

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	WO 93 24239 A (NORDSON NEDERLAND ;GEUL HERMAN ROBERT (NL)) 9 December 1993 * page 3, line 13 - page 6, line 18; figures *	1,3,5	B05C5/02
A	EP 0 329 829 A (MACON KLEBETECHNIK GMBH) 30 August 1989 * column 4, line 48 - column 7, line 31; figures *	2	
A	US 4 156 398 A (MCDANIEL DAVID C) 29 May 1979 * column 6, line 1 - column 10, line 10; figures *	1	
A	EP 0 422 399 A (NORDSON CORP) 17 April 1991 * abstract; figures *	1,4	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
B05C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	17 July 1997	Mouton, J

CATEGORY OF CITED DOCUMENTS

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