(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 072 433 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.06.2009 Bulletin 2009/26

(51) Int Cl.:
B65H 3/56 *(2006.01)* ***B65H 3/04*** *(2006.01)*

(21) Application number: **07150367.6**

(22) Date of filing: **21.12.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK

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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) **Apparatus for processing a stack of sheets**

(57) An apparatus serves for processing a stack (6) of sheets. The apparatus comprises a frame (2), a conveyer (8) mounted in the frame for during operation carrying the stack along the frame, a barrier wall (5) extending across the conveyer and a slot (14,18,21) between the barrier wall and the conveyer for allowing a sheet from the bottom of the stack to pass through the slot but not the remainder of the stack. At least the lower part of the barrier wall comprises a brush (11,17). The apparatus has a simple and inexpensive construction, which in a reliable way operates with a rather high rate of motion without risk for harming the sheets, which can be of varying size and thickness.

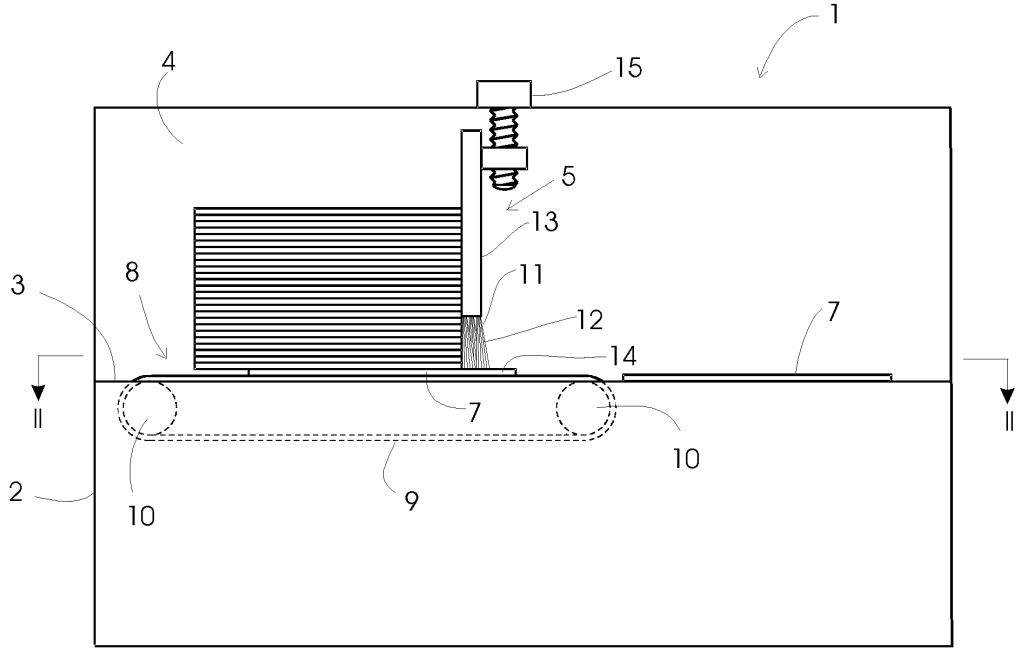

Fig.1

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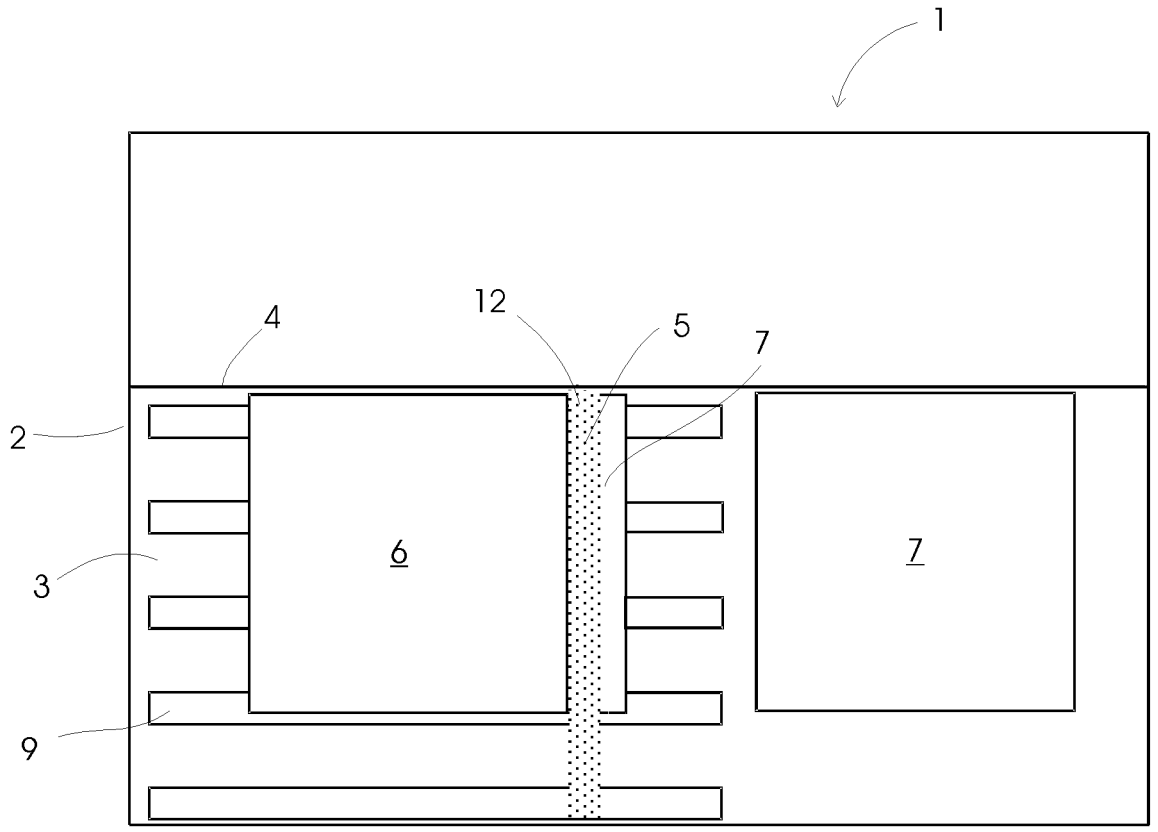

Fig.2

Description

[0001] The invention relates to an apparatus for processing a stack of sheets. The apparatus comprises a frame, a conveyer mounted on the frame for during operation carrying the stack along the frame, a barrier wall extending across the conveyer and a slot between the barrier wall and the conveyer for allowing a sheet from the bottom of the stack to pass through the slot but not the remainder of the stack.

[0002] Apparatuses of this kind are generally used for separating stacks of e.g. paper, magazines, newspapers banknotes or envelopes into individually sheets.

[0003] In many applications are the individually sheets further fed one by one directly to e.g. a letter opener, a franking machine, an inserters of letters into envelopes, a counter and a printer.

[0004] Separating stacks of sheets into individually sheets is an important stage for a subsequently processing of the sheets in a further stage like e.g. letter openers, inserters of letters into envelopes, franking machines, counters and printers.

[0005] During the years much efforts therefore have been made for developing and improving apparatuses for separating sheets supplied in stacks.

[0006] A separator for separation sheets supplied in stacks is known from the US. Publication No. 3504909. The uppermost sheet is during operating sucked up onto an overlying perforated belt arranged for individually removing said sheet from the top of the stack. The removed sheet subsequently is running through another step for securing that only one sheet at a time is leaving the separator for being processed in one ore more succeeding steps.

[0007] This known separator has a complicated and costly construction with a relatively low capacity and the security of operation is furthermore relatively low. If the sheets are not placed dead straight in the stack and/or if the sheets are not all of the same size the risk for removing two or more sheets from the top of the stack instead of only one is considerable. Separating of e.g. magazines are impossible as only the uppermost sheet of such magazines can be kept by suction on the underside of the perforated belt with that disadvantageous result that the magazine will open and thereby stop further functioning of the apparatus.

[0008] The European Patent Application No. 0 376 520 discloses an apparatus for individually removing sheets from the bottom of a stack. An underlying conveyer is during operation carrying the stack along to a barrier wall. A slot between the barrier wall and the conveyer allows one sheet at a time only to pass through the slot for being fed to one ore more succeeding process stages.

[0009] The apparatus of said European Patent Application can handle sheets of different size and thickness and also objects like magazines consisting of more sheets.

[0010] Apparatuses of this kind are however normally arranged for high-speed handling of sheets whereby turbulent high rate airflows through and around the slot are generated during operation. These airflows are acting upon the sheets to be separated in such way that the orientation of the separated sheets is more or less lost and sheets are damaged by wholly or partly hitting the barrier wall instead of only passing the slot whereby the capacity and the security of operation are influenced too.

[0011] The above-mentioned disadvantages of the prior art apparatus for processing a stack of sheets are according to the present invention remedied by,

in a first aspect of the invention providing an apparatus of the kind mentioned in the opening paragraph which has a simple and inexpensive construction,

in a second aspect of the invention providing an apparatus of the kind mentioned in the opening paragraph which is more reliable in operation than hitherto known,

in a third aspect of the invention providing an apparatus of the kind mentioned in the opening paragraph which is able to handle sheets with a higher rate of motion than hitherto known,

in a fourth aspect of the invention providing an apparatus of the kind mentioned in the opening paragraph which securely is able to handle sheets of varying sizes and thickness,

in a fifth aspect of the invention providing an apparatus of the kind mentioned in the opening paragraph which is arranged for handling sheets in such lenient way the they are not damaged during operation,

in a sixth aspect of the invention providing an apparatus of the kind mentioned in the opening paragraph which is able to adjust itself in relation to varying thickness of the sheets.

[0012] The novel and unique features of the invention whereby these features are achieved consist in the fact that at least the lower part of the barrier wall comprises a brush.

[0013] The barrier wall is, according to the invention, preferable arranged in such way that only the bristle of the brush are touching the surface of the sheet passing underneath the brush.

[0014] The downwards-directed pressure on the sheet thereby is divided up into many small pressures each determined by the strength of the respective bristle of the brush only. Thereby is obtained that the total pressure evenly is distributed over the area of the sheet and that creased sheets, if any securely would be straightened out so that there will be no upstanding part of the sheet which possibly could be caught of the barrier wall and prevent the high-speed operation of the apparatus to be continued.

[0015] Simultaneously is advantageously obtained that the sheets are not harmed by the barrier wall itself since the flexible bristle of the brush are elastically bent only by meeting obstructions on the passing sheets.

[0016] The brush moreover easily can adapt itself to different thickness of the sheets and each bristle of the brush furthermore is able individually to change its shape

in accordance with variations of the shape of the envelope in different areas so that conveying of the envelopes can take place without being hindered by obstacles on the envelope.

[0017] The sheets are passing the slot between the brush and the conveyer with a high rate of motion whereby airflow is created in and around the slot. This airflow tends to displace and turn the sheets passing the slot when using a conventionally stiff barrier wall with that disadvantageous result that the operation of the opener cannot be proper carried out and that the capacity of the opener will be low.

[0018] The brush according to the invention does however not form such stiff barrier wall but is on the contrary permeable to air in its total height. A deleterious airflow therefore will not be generated when using the brush according to the invention. The apparatus of the invention therefore can operate without any undesirable interference of the operating and moreover with an exceptionally high capacity.

[0019] The apparatus according to the invention is furthermore capable of adjusting itself in relation to varying thickness of the sheets in the stack owing to the fact that the bristles of the brush according to the invention are flexible.

[0020] It is important that only one sheet at a time is passing the slot. This can, according to the invention, be achieved by making the width of slot between the brush and the conveyer decreasing into the direction of conveyance so that the downstream placed bristles can stop sheets which possibly has not been stopped already by the upstream placed bristles.

[0021] Said decreasing of the width of the slot can be obtained by attaching the bristle in one brush only, but in another embodiment of the apparatus according to the invention can the brush be divided up into more brush parts. e.g. a first and second brush part, seen into the direction of conveyance of the sheets, whereby the width of the slot is larger at the first brush than at the second brush.

[0022] If the leading edge of more than one sheet unintended has passed the brush or the first brush part those sheets will, according to the invention, be stopped of the bristles in the downstream placed bristles in the brush or of the bristles in a subsequent brush part.

[0023] The height of the brush plus the width of the slot can have the same or a larger height than the stack of sheets to be handled.

[0024] In a preferred embodiment according to the invention can the brush however be attached to an upper part of the barrier wall whereby said upper brush part is having a height which is the same or larger than the stacks of sheets to be handled minus the height of the brush plus the width of the slot.

[0025] According to the invention can the barrier wall also include a stiff front part having the same or a larger distance to the conveyer than the brush. Such stiff front part of the barrier wall can be useful for protecting the brush against being overloaded, especially by handling stacks of heavy sheets.

[0026] The lower edge of such stiff front part of the barrier wall can have the same distance to the conveyer as the width of the slot between the brush and the conveyer. Said distance is however preferable larger than the thickness of the sheets to be handled so that it will be the flexible bristles of the brush which would be the careful stop for sheets which should not be allowed to pass the slot and not the stiff front part which could harm the sheets.

[0027] In one embodiment according to the invention can the front part of the barrier wall be placed close to the brush whereby the bristles of the brush will be pre-stressed so that they can be more proof against the load resting on the bristles.

[0028] The front part of the barrier wall can in another embodiment be placed at a distance from the brush so that the bristles of the brush will not be pre-stressed and therefore advantageously can be able to function like the other bristles of the brush.

[0029] The bristles of the brush can owing to their flexibility within a large range of widths of the slot adjust themselves to varying thickness of the sheets to be handled.

[0030] The apparatus according to the invention can however be equipped with means like e.g. adjusting screws for directly being able to adjust the width of the slot between the barrier wall and the conveyer to the thickness of the sheets to be handled.

[0031] The apparatus according to the invention can be arranged for separating only a stack of sheets like e.g. paper, magazines, newspapers, banknotes or envelopes.

[0032] In many applications can the apparatus according to the invention be arranged for also feeding the separated sheets to e.g. a letter opener, a franking machine, an inserter of letters into envelopes, a counter and a printer.

[0033] A second conveyer can in this case be mounted on the frame for carrying sheets, which are passing or has passed through the slot between the barrier wall and the first conveyer along the frame. A second brush can then be mounted onto the frame close to or in contact with said sheets for keeping the sheets down against the second conveyer and thereby secure a reliable conveyance of the sheets.

[0034] The brush can be placed above the second conveyer but is preferable placed outside the area of the second conveyer for avoiding generating of heat in consequence of pressure, which the conveyer and the second brush could load on the sheets.

[0035] It is important that the deciding edges of the sheets are flushing for thereby securing that the subsequent processing of the sheets is correctly performed.

[0036] A registration wall therefore, according to the invention, can be mounted on the frame whereby the second conveyer and the second brush are forming an acute angle with this wall. This construction implies that

advantage that the sheets during the conveying on the second conveyer successively are moved against the registration wall whereby the sheets effectively are being lined up with flushing edges.

[0037] The invention will be explained in greater details below where further advantageous properties and example embodiments are described with reference to the drawings, in which

Fig. 1 is a lateral view of one embodiment of the apparatus according to the invention with a stack of sheets being separated,

Fig. 2 is a sectional view along the line II - II in fig. 1,

Fig. 3 is a lateral view of another embodiment of the apparatus according to the invention with a stack of sheets being separated,

Fig. 4 is a sectional view along the line IV - IV in fig. 3,

Fig. 5 is a lateral view of third embodiment of the apparatus according to the invention with a stack of sheets being separated,

Fig. 6 is a sectional view along the line VI - VI in fig. 5,

Fig. 7 shows the apparatus shown in fig. 1 - 6 seen from the rear,

Fig. 8 is a sectional front view of the apparatus shown in fig. 5 and 6 but without any stack of sheets,

Fig. 9 is a lateral view of a fourth embodiment of the apparatus according to the invention with a stack of sheets being separated and fed for further processing, and

Fig. 10 is a sectional view along the line X - X in fig. 9.

[0038] Fig. 1, 2 and 7 shows an apparatus 1 according to the invention in one embodiment.

[0039] The apparatus 1 comprises a frame 2 with a table 3 and in this case an upright sidewall 4. A barrier wall 5 for a stack 6 of sheets 7 is mounted crosswise the frame.

[0040] A conveyer 8 is moreover mounted on the table for carrying the stack of sheets along into the direction of the barrier wall. The conveyer is in this case formed as a number of endless belts 9 running over rollers 10 driven during operation by means of a motor, (not shown). It is noted that other types of conveyers like rollers alone or chains conveyers just as well can be used.

[0041] The barrier wall 5 consists in this embodiment of a brush 11 with flexible bristles 12 and a stiff upper barrier part 13 for mounting the brush.

[0042] A slot 14 is formed between the lower edge of the brush and the topside of the conveyer. The width of this slot is chosen such that only one sheet at a time can pass the slot.

[0043] During operation is the conveyer 8 activated with the result that the stack 6 of sheets 7 is moved along the frame until the barrier wall stops the stack except the bottom sheets 7 in the stack.

[0044] This situation is seen in fig. 1 and 2 which is showing also that the bottom sheet is about to pass the slot and that a preceding sheet already has passed the slot and now is placed on the table of the apparatus.

[0045] The brush can, owing to the flexibility of its bristles, adjust its self within a large range to varying thickness of the sheets.

[0046] An adjusting screw 15 serves however for additionally adjusting of the width of the slot, if needed.

[0047] The flexible bristles of the brush secure an even loading of the sheets passing the slot and that sheets therefore can pass the slot without being harmed and without any risk for stopping the operation by being caught of the barrier wall.

[0048] The sheets are passing the slot with high speed whereby a heavy airflow arises through and around the slot when using stiff barrier walls as conventional. Such airflow tends to displace the orienting of the sheets in an undesired way.

[0049] This problem is avoided by means of the apparatus according to the invention since the brush is permeable for air and a heavy airflow therefore cannot arise.

[0050] Fig. 3 and 4 shows an apparatus 16 according to the invention in a second embodiment, which in the main corresponds to the apparatus 1 shown in fig. 1 and 2. Identical parts therefore are denoted with same numerals.

[0051] This second embodiment has besides the first brush 11 a second brush 17 placed, in this case, at a distance from the first brush 11. Alternatively can the second brush be placed close to the first brush.

[0052] The slot 18 between the second brush 17 and the conveyer 8 is smaller than the slot 14 between the first brush 11 and the conveyer 8 whereby advantageously is obtained that sheets which unintended has passed the slot together with the bottom sheet in the stack is retained by the second brush.

[0053] Fig. 5 and 6 shows an apparatus 19 according to the invention in a third embodiment, which in the main corresponds to the apparatus 1 shown in fig. 3 and 4. Identical parts therefore are denoted with same numerals.

[0054] A stiff front part 20 is in this third embodiment added to the barrier wall shown in fig. 3 and 4 where the barrier wall is equipped with two brushes 11 and 16. This stiff front part protects the brushes against being overloaded. This quality is especially advantageous when operating heavy sheets.

[0055] The slot 21 between the lower edge of the stiff front part 20 of the barrier wall and the conveyer 8 is preferable larger than the slot 14 between the first brush 11 and the conveyer 8 so that it will be the flexible bristles

of the brush which gentle will engage the sheets in the lower part of the stack and not the stiff front part which could harm the sheets.

[0056] The stiff front barrier wall can be placed at a distance from the brushes as seen in fig. 5 and 6 but can alternatively be placed close to the brushes.

[0057] In fig. 8 is the apparatus 19 shown in fig. 5 and 6 shown from ahead but without the stack of sheets.

[0058] The slot 21 between the stiff front part 20 of the barrier wall and the conveyer 8 is, as seen, larger then than the slot 14 between the first brush 11 and the conveyer 8 so that the lower part of the first brush 11 is extending below said front part 20 and only the bristles of the brush therefore advantageously can engage the sheets in the lower part of the stack of sheets.

[0059] Fig. 8 also shows the conveyer 8 with a roller 10 for during operating driving the belts 9 by activating a motor 22.

[0060] The apparatus 1, 16 and 19 described above with reference to the figures 1 - 8 are all arranged for separating stacks of sheets like e.g. paper, magazines, newspapers banknotes or envelopes into individually sheets.

[0061] Sheets of this kind are, after having been separated, generally processed in a subsequent site of operation like e.g. a letter opener, a franking machine, an inserter of letters into envelopes, a counter and a printer.

[0062] Those sites of operation are well known technique and are not any part of the invention. They therefore are not shown in the figures and they will not be described further here.

[0063] In the fourth embodiment is the apparatus 23 divided up into a separating part 24 and a feeding part 25.

[0064] The separating part 24 corresponds to the apparatus 1 shown in fig. 1 and 2. Identical parts therefore are denoted with same numerals.

[0065] The feeding part 25 is formed as an extension of the separation part 24 and comprises a longitudinally extending second conveyer 26 for carrying separated sheets along to the site of operation in question (not shown) and a longitudinally extending second brush 27 for keeping the separated sheets in proper contact with the second conveyer.

[0066] The second conveyer is formed as an endless belt 28 running over rollers 29 driven during operation by means of a motor, (not shown). It is noted that other types of conveyers like rollers alone or chains conveyers just as well can be used

[0067] The feeding part of the apparatus also comprises a registration wall 30, which in this case is formed as an extension of the sidewall 4 of the separating part 24.

[0068] The second brush is furthermore placed outside the area of the second conveyer for thereby avoiding that the conveyed sheets disadvantageously are affected by heat generated by the press, which the second conveyer and second brush is loading on the sheets from both sides.

[0069] In the figures 9 and 10 is the second brush 27 placed in front of the second conveyer.

[0070] The second brush 27 is forming an acute angle with the registration wall 30 while the second brush 27 is forming the same acute angle with this wall.

[0071] During operation of the fourth embodiment of the apparatus 23 according to the invention is the stack 6 of sheets 7 separated in the separating part 24 of the apparatus into individually sheets 7. Subsequently are these sheets conveyed further along the feeding part 25 of the apparatus to the sites of operation in question, (not shown) by means of the second conveyer.

[0072] The longitudinally extending second brush 27 serves for keeping the separated sheets against the second brush for securely being able to convey the sheets along the feeding part 25 simultaneously with that the sheets are biased crosswise against the registration wall 30 for being lined up before being processed at the site of operation in question, (not shown).

Claims

1. An apparatus for processing a stack (6) of sheets, comprising a frame (2), a conveyer (8) mounted on the frame for during operation carrying the stack along the frame, a barrier wall (5) extending across the conveyer and a slot (14,18,21) between the barrier wall and the conveyer for allowing a sheet from the bottom of the stack to pass through the slot but not the remainder of the stack, **characterized in that** at least the lower part of the barrier wall comprises a brush (11,17).

2. An apparatus according to claim 1, **characterized in that** the slot (14,18,21) between the brush (11,17) and the conveyer (8)is arranged for securing that the sheets (7) during operation are passing through the slot between the barrier wall and the conveyer one by one.

3. An apparatus according to claim 1 or 2, **characterized in that** the width of the slot (14,18,21) between the brush (11,17) and the conveyer (8) is decreasing into the direction of conveyance.

4. An apparatus according to claim 1, 2 or 3 **characterized in that** the brush (11,17) is divided up into a first and second brush part (11) and (17), seen into the direction of conveyance, and that the with of the slot (14) between the first brush part and the conveyer is larger than the width of the slot (18) between the second brush part and the conveyer.

5. An apparatus according to claim 4, **characterized in that** the first and second brush parts are placed at a distance from each other.

6. An apparatus according to any of the claims 1 -5,

characterized in that the brush (11,17) is mounted onto an upper part (13) of the barrier wall (5).

7. An apparatus according to any of the claims 1 - 6, **characterized in that** the barrier wall (5) comprises a stiff front part (20) having the same or a larger distance (21) to the conveyer than the brush (11,17).

8. An apparatus according to claim 7, **characterized in that** the stiff front part (20) of the barrier wall (5) is placed close to the brush (11).

9. An apparatus according to claim 7, **characterized in that** the stiff front part (20) of the barrier wall (5) is placed at a distance from the brush (11).

10. An apparatus according to any of the claims 1 - 9, **characterized in that** the apparatus comprises means (15) for adjusting the width of the slot (14,18,21) between the barrier wall (5) and the conveyer (8).

11. An apparatus according to any of the claims 1 - 10, **characterized in that** a longitudinally extending second conveyer (26) is mounted onto the frame (2) for carrying sheets (7) passed through the slot (14,18,21) between the barrier wall (5) and the first conveyer (8) along the frame and that a longitudinally extending second brush (27) is mounted onto the frame close to or in contact with said sheets.

12. An apparatus according to claim 11, **characterized in that** the frame (2) comprises a registration wall (30) which preferably is extending into the same direction as the side wall (4) of the separation part (24) of the apparatus and that the second conveyer forms an acute angle with this wall while the second brush (27) preferably is forming the same acute angle with the wall.

13. An apparatus according to claim 11 or 12, **characterized in that** the second brush (27) is placed outside the area of the second conveyer (26).

14. An application of the apparatus according to any of the claims 1 - 10 for separating stacks (6) sheets (7) like e.g. paper, magazines, newspapers, banknotes or envelopes.

15. An application of the apparatus according to any of the claims 11 - 13 for separating and feeding sheets (7) to e.g. a letter opener, a franking machine, an inserters of letters into envelops a counter and a printer.

Amended claims in accordance with Rule 137(2) EPC.

1. An apparatus for separating and feeding sheets from a stack (6) of sheets, comprising

- a frame (2)
- a conveyer (8) mounted onto the frame for during operation carrying the stack along the frame, and
- a barrier wall (5) for the stack extending across the conveyer, **characterized in**
- **that** at least the lower part of the barrier wall consists of a brush (11,17),
- **that** a slot is formed between the lower edge of the brush for allowing a sheet from the bottom of the stack to pass through the slot but not the remainder of the stack,
- a longitudinally extending second conveyer (26) mounted onto the frame (2) for carrying sheets (7) passed through said slot (14,18,21) along the frame, and
- a longitudinally extending second brush (27) mounted onto the frame close to or in contact with said sheets.

2. An apparatus according to claim 1, **characterized in that** the slot (14,18,21) between the brush (11,17) and the conveyer (8)is arranged for securing that the sheets (7) during operation are passing through the slot between the barrier wall and the conveyer one by one.

3. An apparatus according to claim 1 or 2, **characterized in that** the width of the slot (14,18,21) between the brush (11,17) and the conveyer (8) is decreasing into the direction of conveyance.

4. An apparatus according to claim 1, 2 or 3 **characterized in that** the brush (11,17) is divided up into a first and second brush part (11) and (17), seen into the direction of conveyance, and that the with of the slot (14) between the first brush part and the conveyer is larger than the width of the slot (18) between the second brush part and the conveyer.

5. An apparatus according to claim 4, **characterized in that** the first and second brush parts are placed at a distance from each other.

6. An apparatus according to any of the claims 1 -5, **characterized in that** the brush (11,17) is mounted onto an upper part (13) of the barrier wall (5).

7. An apparatus according to any of the claims 1 - 6, **characterized in that** the barrier wall (5) comprises a stiff front part (20) having the same or a larger distance (21) to the conveyer than the brush

(11,17).

8. An apparatus according to claim 7, **characterized in that** the stiff front part (20) of the barrier wall (5) is placed close to the brush (11).

9. An apparatus according to claim 7, **characterized in that** the stiff front part (20) of the barrier wall (5) is placed at a distance from the brush (11).

10. An apparatus according to any of the claims 1 - 9, **characterized in that** the apparatus comprises means (15) for adjusting the width of the slot (14,18,21) between the barrier wall (5) and the conveyer (8).

11. An apparatus according to claim 10, **characterized in that** the frame (2) comprises a registration wall (30) which preferably is extending into the same direction as the side wall (4) of the separation part (24) of the apparatus and that the second conveyer forms an acute angle with this wall while the second brush (27) preferably is forming the same acute angle with the wall.

12. An apparatus according to claim 10 or 11, **characterized in that** the second brush (27) is placed outside the area of the second conveyer (26).

13. An application of the apparatus according to any of the claims 1 - 12 for separating and feeding sheets from a stack (6) of sheets (7) like e.g. paper, magazines, newspapers, banknotes or envelopes.

14. An application of the apparatus according to any of the claims 1 - 13 for separating and feeding sheets (7) to e.g. a letter opener, a franking machine, an inserters of letters into envelops, a counter, and a printer.

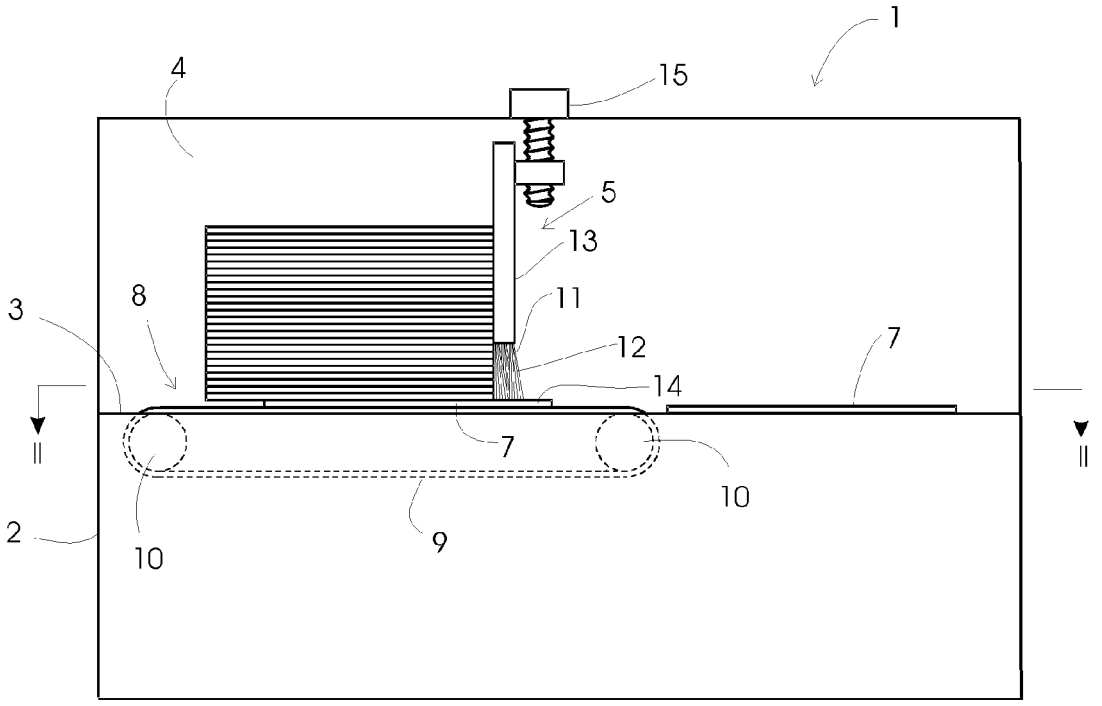

Fig.1

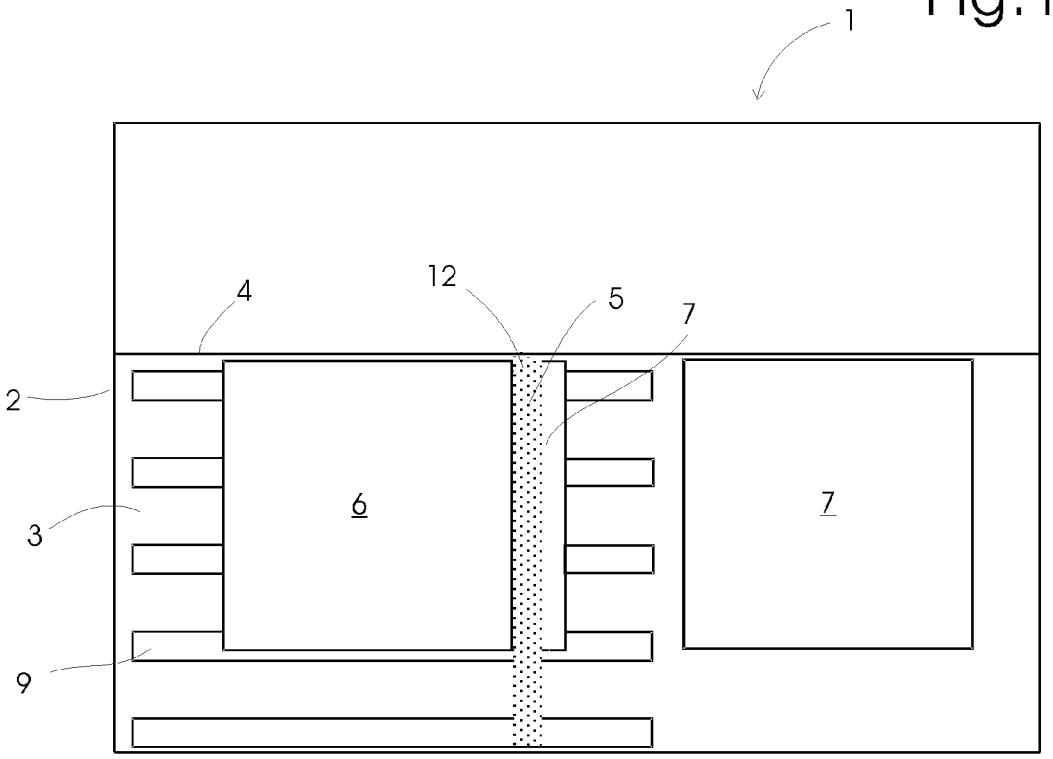

Fig.2

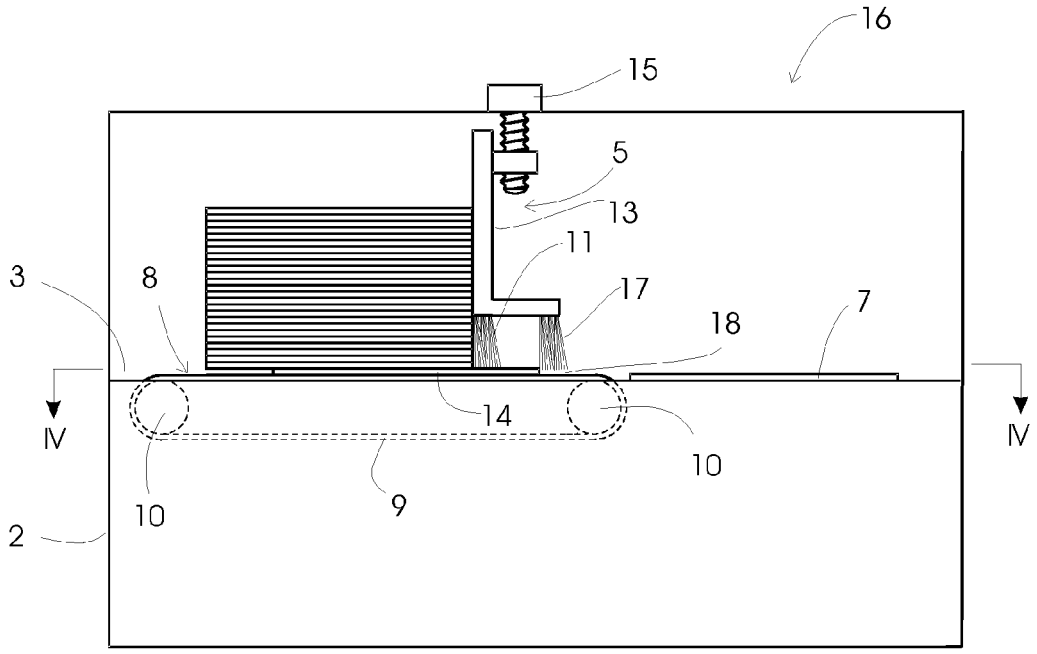

Fig.3

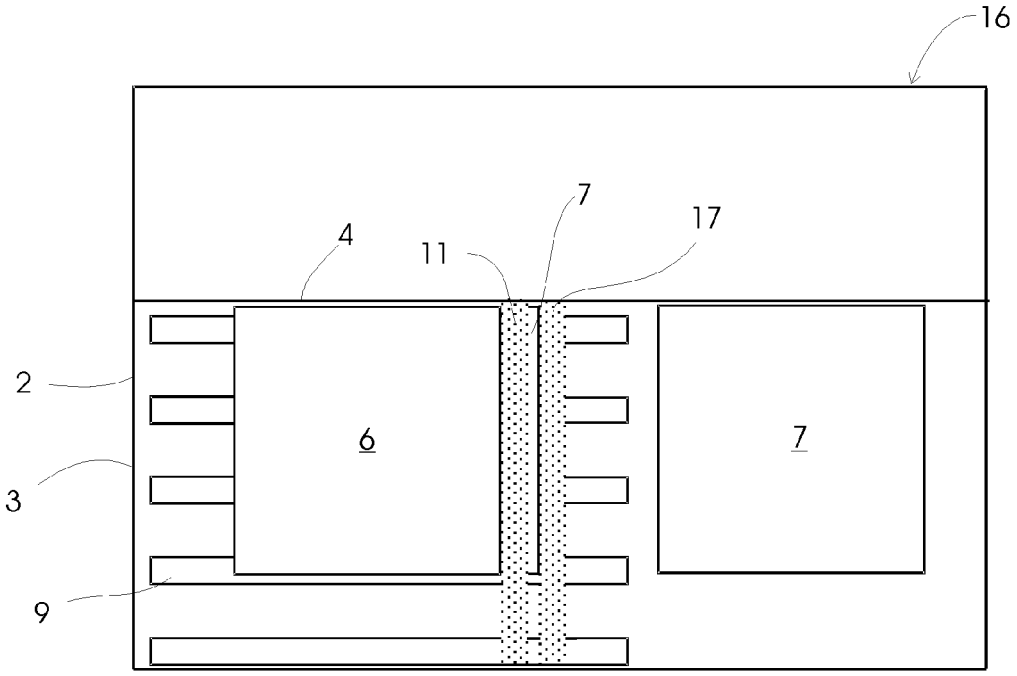

Fig.4

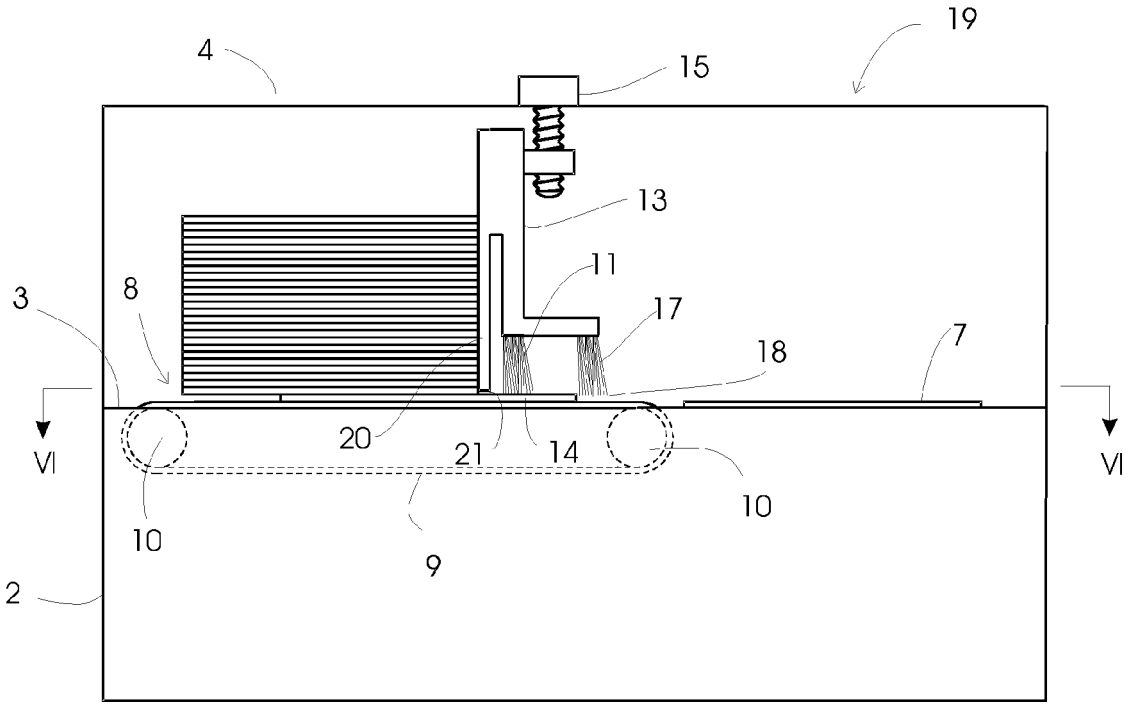

Fig.5

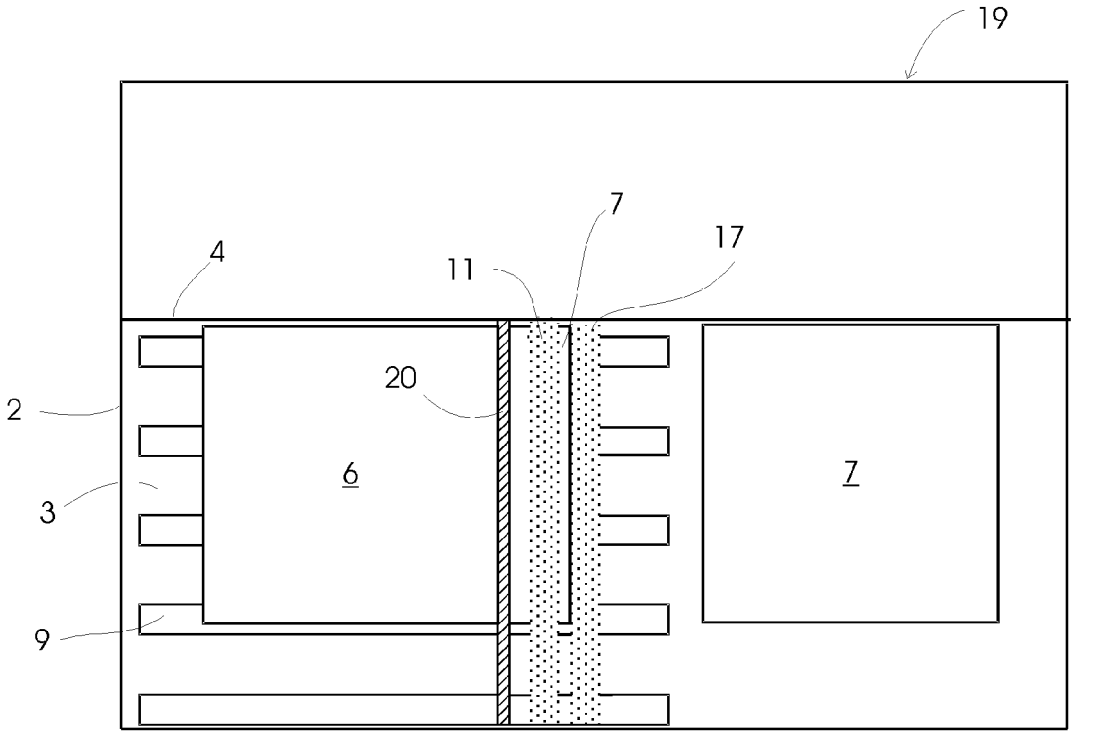

Fig.6

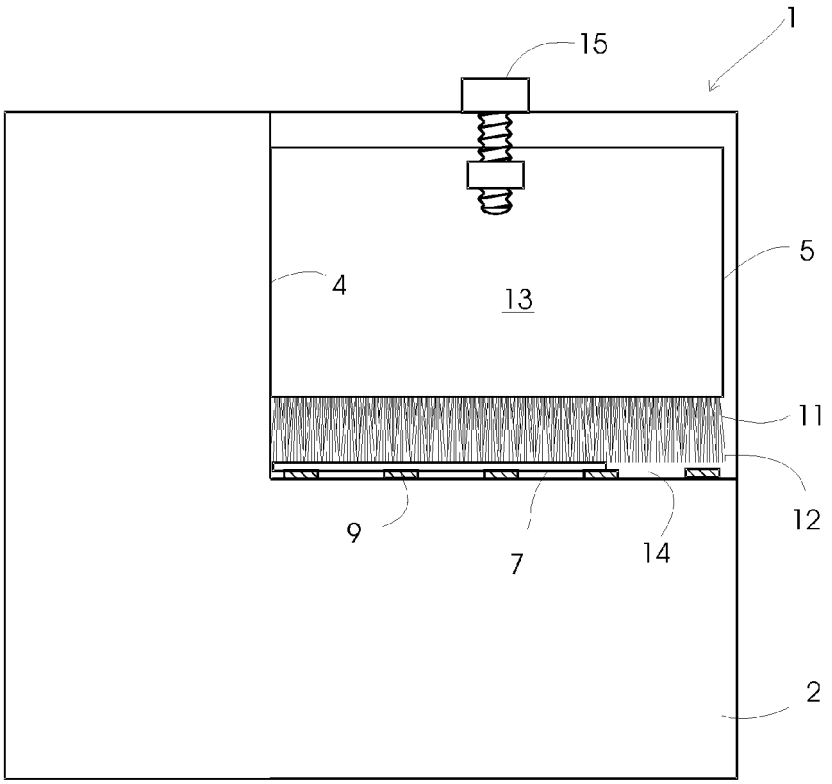

Fig.7

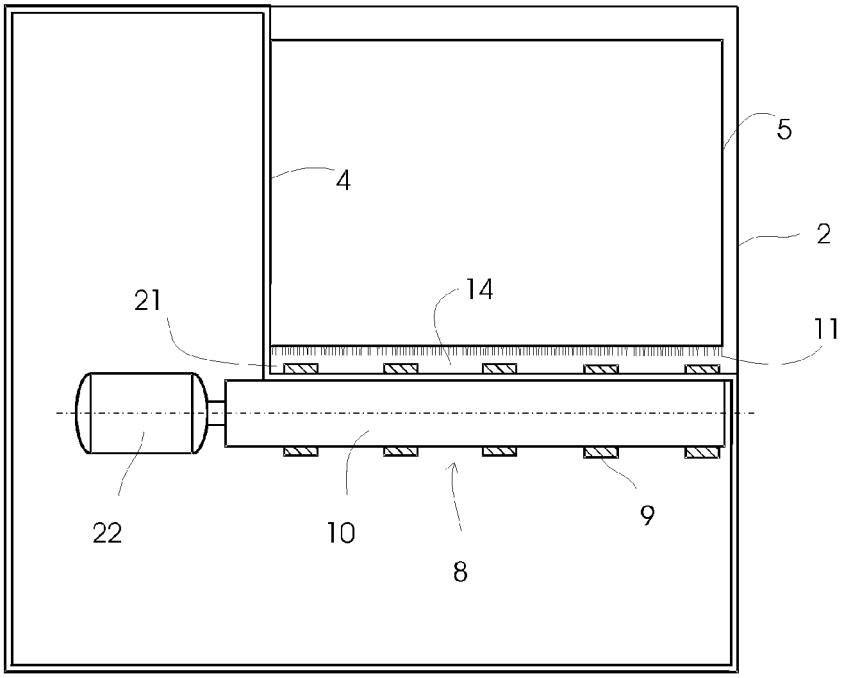

Fig.8

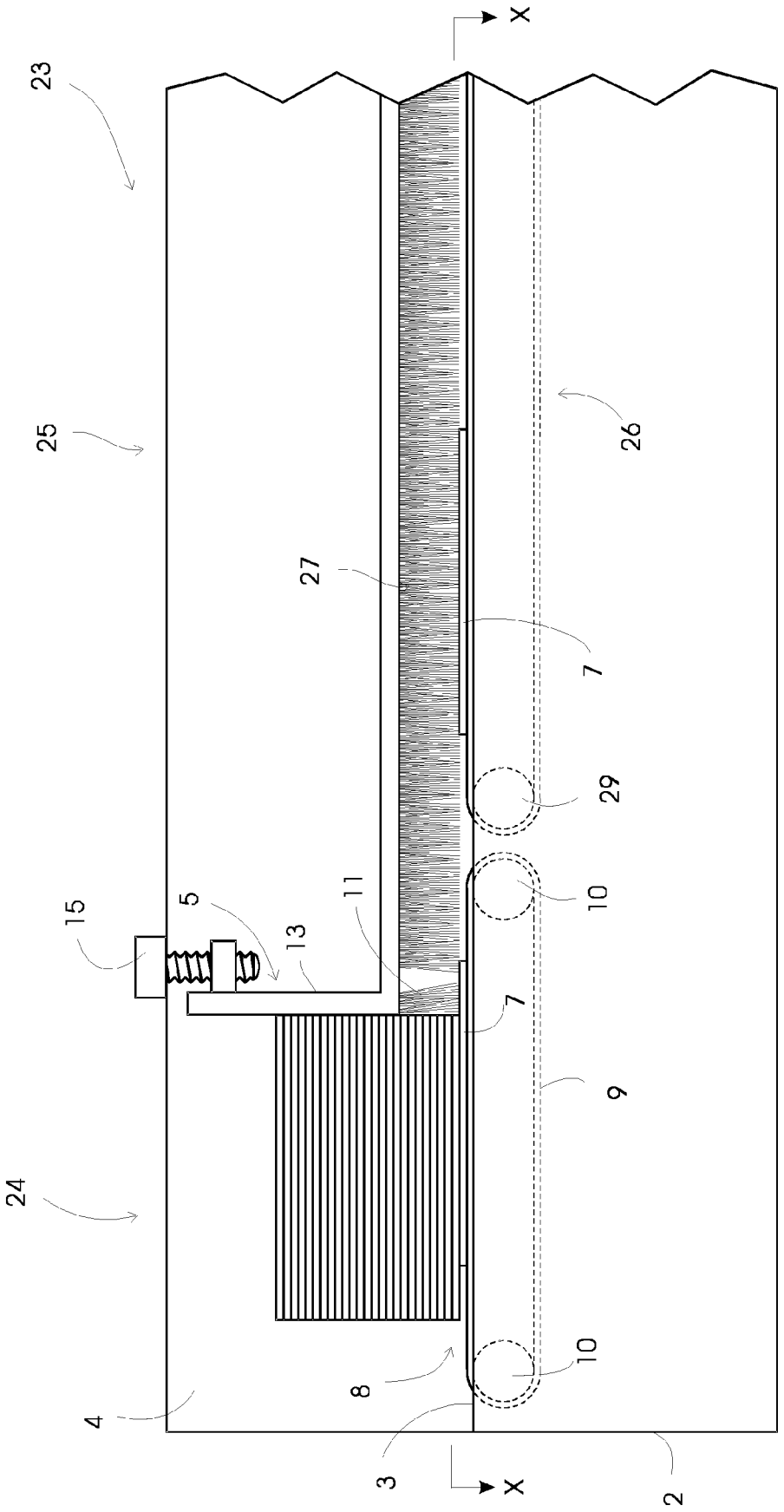

Fig. 9

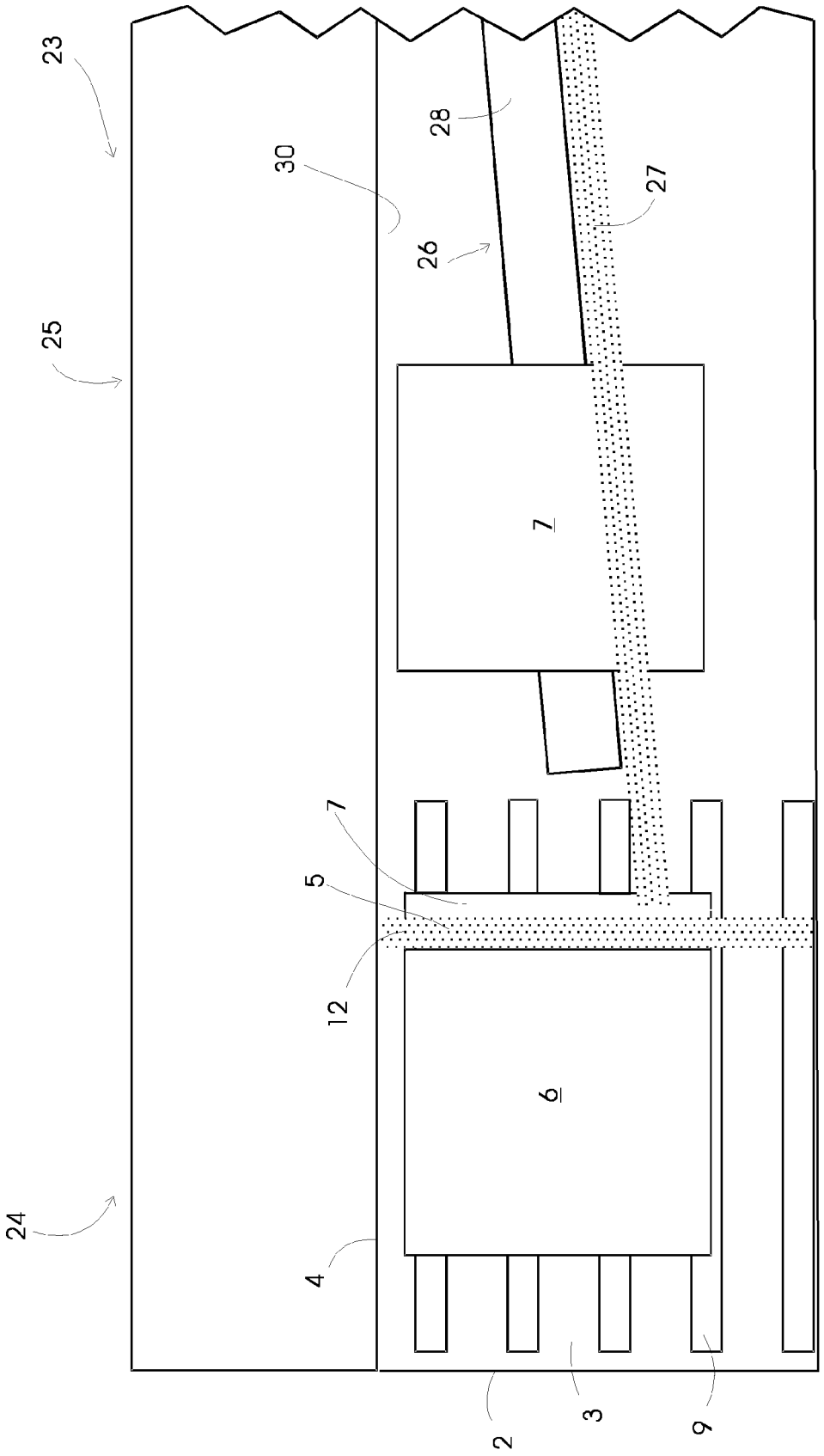

Fig. 10

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 15 0367

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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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	6 August 2008	Henningsen, Ole

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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& : member of the same patent family, corresponding document

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 07 15 0367

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-10,14,15

Transversely extending separation and retaining means

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2. claims: 11-13

Longitudinally extending guiding means

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 15 0367

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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