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

(11) EP 2 266 426 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
29.12.2010 Bulletin 2010/52

(51) Int Cl.:
A24D 3/02 *(2006.01)*

(21) Application number: **10165617.1**

(22) Date of filing: **11.06.2010**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
BA ME RS

(30) Priority: **22.06.2009 IT BO20090404**

(71) Applicant: **G.D S.p.A.**
40133 Bologna (IT)

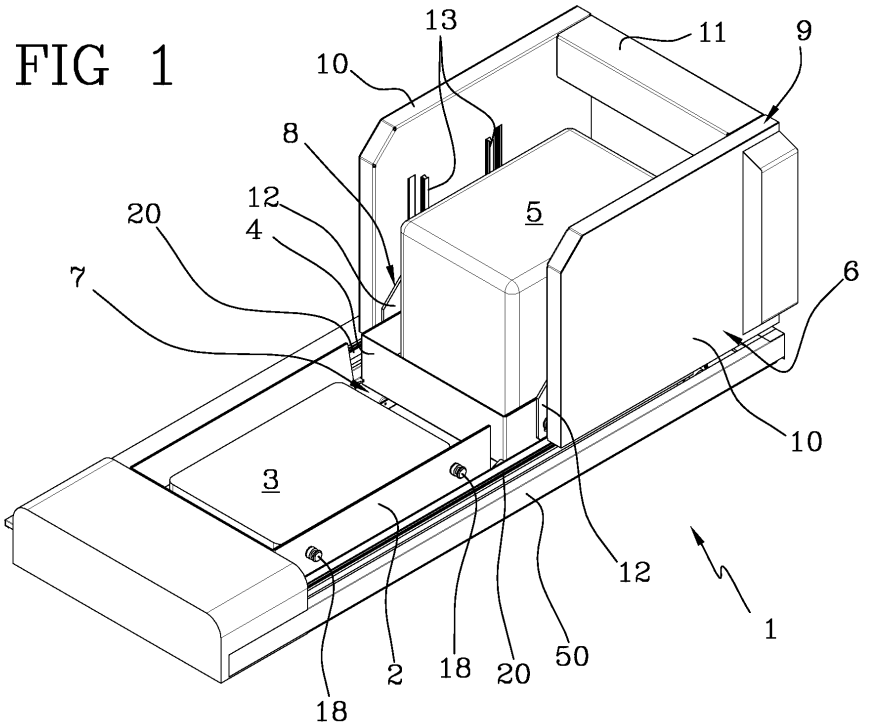
(72) Inventors:
- **Sgrignuoli, Vittorio**
  40127, BOLOGNA (IT)
- **Balletti, Leonardo**
  40068, SAN LAZZARO DI SAVENA (Bologna) (IT)
- **Eusepi, Ivan**
  40013, CASTELMAGGIORE (Bologna) (IT)

(74) Representative: **Lanzoni, Luciano**
Bugnion S.p.A.
Via di Corticella, 87
40128 Bologna (IT)

(54) A device for supplying material to a machine manufacturing tobacco products

(57) A machine manufacturing tobacco products, typically filters for cigarettes, is supplied continuously with bales of cellulose acetate tow by a device equipped with a first tray (2) holding a first such bale (3) of material in the process of depletion, movable from an operating position to a standby position, and a second tray (4) holding a replacement bale (5), movable from the standby position into the operating position; the second tray (4) is elevated and transferred from the standby position to the operating position by a handling component (6), and the first tray (2) conveyed from the operating position to the standby position by a translation component (7) operating simultaneously with the handling component (6), so that the positions of the depleted bale and the replacement bale can be switched in a single operation.

FIG 1



EP 2 266 426 A1

Description

[0001] The present invention relates to a device for supplying material to a machine manufacturing tobacco products.

[0002] In particular, the present invention finds application advantageously for the purpose of supplying palletized material to machines used in the manufacture of tobacco products.

[0003] The generic term "tobacco products" used in the present specification can be taken to include cigarettes and cigars, filter tips for cigarettes, also packets of cigarettes, cartons of cigarettes, and cases containing multiple cartons. In other words, the device according to the present invention can be utilized in combination with a machine such as a cigarette maker, or a cigar maker or a filter maker, and similarly, in conjunction with cigarette packers, cellophaners, cartoners or case packers.

[0004] Accordingly, whilst reference is made explicitly hereinafter to machines for the production of cigarette filters, which must be supplied continuously with palletized bales of filter material, no limitation in scope is implied.

[0005] In the tobacco industry, the manufacture of cigarette filters involves processing a filter material that consists in a ribbon or stream of cellulose acetate fibres, known conventionally as 'tow'.

[0006] The material in question is drawn from compressed bales of the aforementioned fibres, directed through processing stations and formed ultimately into a continuous cylindrical rod with an outer wrap of paper material.

[0007] More exactly, the compressed bales are placed on and handled with the aid of special bases, such as pallets, and positioned in an operating area immediately upstream of a machine by which the aforementioned cigarette filters are produced.

[0008] As one bale of filter material nears depletion, steps must be taken swiftly to replace it with a new bale of the same material, so as to ensure there will be no break in continuity of the manufacturing process.

[0009] More exactly, the replacement bale is positioned in a standby area alongside the bale nearing depletion, and connected to this same bale. In other words, a trailing end of the bale nearing depletion is spliced to a leading end of the new bale, in such a way that the supply of the filter material to the production machine will be uninterrupted.

[0010] The depleting bale and the relative pallet are moved to a temporary storage area immediately adjacent to the operating area, so that the operating area is left free. In this way, the pallet with the new bale can be positioned in the operating area.

[0011] Finally, the pallet vacated by the depleted bale is distanced from the temporary storage area and removed altogether.

[0012] In prior art systems, the pallets of filter material are manoeuvred between the aforementioned areas utilizing a transfer device that operates by moving the single pallets one at a time from one area to the other.

[0013] Disadvantageously, to ensure that the changeover of the pallets and the preparation of the new bale of filter material can be accomplished swiftly, a significant amount of space is required around the production machine if the pallets are to be moved and positioned without difficulty.

[0014] Accordingly, the object of the present invention is to obviate such drawbacks through the adoption of a device for supplying material to a machine manufacturing tobacco products, which requires considerably less space for the intended purpose than devices typical of the prior art.

[0015] The stated object is realized in a device for supplying material to a machine manufacturing tobacco products, of which the features are recited in one or more of the claims appended.

[0016] The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

- figures 1-7 show a device embodied according to the present invention for supplying material to a machine manufacturing tobacco products, viewed in perspective and illustrated in a succession of distinct operating steps;
- figure 8 shows the device according to the present invention in a front elevation view;
- figure 9 shows the device according to the invention in a section on IX-IX in figure 8;
- figure 10 shows the device according to the invention in a section on X-X in figure 8;

[0017] With reference to the accompanying drawings, numeral 1 denotes a device, in its entirety, by which material, in particular palletized material, is supplied to a machine used in the manufacture of tobacco products.

[0018] The term 'pallet' in the following specification indicates any given element suitable for carrying and transferring a load of material that must be fed to a machine manufacturing tobacco products as broadly defined above.

[0019] In the case of the present specification, reference is made to a device for replacing bales of filter material utilized in the manufacture of filter tips applicable to tobacco products, in particular cigarettes.

[0020] The device 1 is installed in close proximity to a production machine by which the aforementioned filters are made. In particular, the device 1 is positioned immediately upstream of the machine in question, and interfaced with an infeed section to which the filter material is supplied.

[0021] The device 1 comprises a base frame 50 resting on the floor, and is equipped with a first tray 2, accommodated by the base frame 50, on which to place a first bale 3 of filter material.

[0022] The first bale 3 will be loaded preferably onto a

relative pallet 51.

[0023] The term 'tray' is used to indicate any given container able to accommodate a bale of material, palletized or otherwise.

[0024] The first tray 2 occupies a position adjacent to the infeed section of the production machine, and accordingly, in the context of the present specification, the first bale 3 of filter material will be the bale that is in the process of depletion, or indeed entirely depleted. In other words, the first tray 2 occupies an operating position.

[0025] The device 1 further comprises a second tray 4 accommodated by the base frame 50, on which to place a second bale 5 of filter material, likewise loaded onto a pallet 51.

[0026] The second tray 4 occupies a position remote from the infeed section of the production machine, and accordingly, in the context of the present specification, the second bale 5 of filter material is the bale that will take the place of the bale in the process of depletion. In other words, the second tray 4 occupies a standby position, in readiness to take the place of the first tray 2.

[0027] In greater detail, the first tray 2 is movable from the operating position to the standby position, where the remains of the fully depleted first bale 3 can be removed. In particular, the first tray 2 is movable along a first positioning direction denoted D1.

[0028] The second tray 4 is movable from the standby position into the operating position, adjacent to the production machine. In particular, the second tray 4 is movable along a second positioning direction denoted D2.

[0029] The device 1 comprises a handling component 6 by means of which the second tray 4 is raised from the standby position (figure 2), translated along the second direction D2 and lowered into the operating position. In this way, the new bale 5 of filter material can be manoeuvred into the operating position, directly opposite the infeed section of the filter maker.

[0030] Similarly, the device 1 comprises a translation component 7 by means of which the first tray 2 is translated along the first direction D1 from the operating position to the standby position.

[0031] To advantage, the activation of the handling component 6 is simultaneous with the activation of the translation component 7. In other words, the displacement of the second tray 4 from the standby position to the operating position occurs simultaneously with the displacement of the first tray 2 from the operating position to the standby position.

[0032] More exactly, the moment that the second tray 4 is raised by the handling component 6 to a given height above that of the first tray 2, the second tray 4 is able to pass over the first tray 2 during the aforementioned positioning movements (figure 3).

[0033] In other words, observing the example of the drawings, the second positioning direction D2 extends substantially parallel, directly above and in vertical alignment with the first positioning direction D1.

[0034] To this end, the handling component 6 comprises an elevator 8 designed to engage and lift the second tray 4 so that it will be located directly above the first tray 2 during the subsequent translational movement induced relative thereto.

[0035] Moreover, the handling component 6 comprises a trolley 9 to which the elevator 8 is mounted in slidable fashion. The trolley 9 in question is designed to transfer the elevator 8, together with the second tray 4 raised by and connected to the elevator 8, from a position directly above the standby position (figure 2) to a position directly above the operating position (figure 4).

[0036] At this point, the second tray 4 will be lowered by the elevator 8 into the operating position (figure 5).

[0037] Once the positions of the first tray 2 and the second tray 4 have been switched, the trolley 9 advances in order to disengage the elevator 8 from the second tray 4 (figure 6), and finally retreats to the point of re-occupying the standby position (figure 7).

[0038] In greater detail, the trolley 9 comprises a pair of lateral uprights 10 translatable between the standby position and the operating position, and a cross member 11 interconnecting the two uprights 10 orthogonally. In words, the trolley 9 presents a substantially gantry-like appearance.

[0039] In use, at least the second tray 4 lies between the lateral uprights 10. More precisely, the tray 4 lies between the uprights 10 both when occupying the standby position, and during the movement toward the operating position. It will be observed moreover that the first tray 2 advances likewise between the uprights 10, when transferred from the operating position to the standby position.

[0040] The trolley 9 thus presents an opening, so that when in the standby position, an operator can gain access to the second tray 4 for the purpose of unloading the remains of the first bale 3 and loading the second bale 5.

[0041] In the embodiment illustrated, the elevator 8 is carried by the uprights 10.

[0042] To this end, the elevator 8 comprises a pair of plates 12, each slidably associated with a respective upright 10.

[0043] In particular, the plates 12 are positioned facing one another and connected to the relative uprights 10 by way of rectilinear tracks 13.

[0044] The trolley 9 carries drive means 14 by which motion is induced in the elevator 8. In greater detail, such drive means 14 comprise a motor 31 connected to the plates 12 by way of transmission components denoted 15. In the example illustrated, such transmission components 15 comprise a pair of belts 30 associated with each plate 12, by which the selfsame plates 12 are set in motion along the relative rectilinear tracks 13 (figure 10).

[0045] By way of example, the motor 31 might be mounted to the cross member 11, and could be connected to both pairs of belts 30.

[0046] Alternatively, the elevator 8 could be equipped with drive means 14 comprising a pair of motors, each associated with a respective plate 12.

[0047] The elevator 8 further comprises at least one pair of hooks 16 positioned to engage at least the second tray 4, in such a way that it can be lifted and thereupon translated in the manner described above. To this end, at least the second tray 4 will present corresponding projections 18 with which the hooks 16 engage.

[0048] In detail, the second tray 4 comprises two pairs of projections 18, one pair on each side of the selfsame tray 4, whilst the elevator 8 comprises two pairs of hooks 16, likewise one pair on each side, presented by the respective plates 12. The hooks 16 are incorporated directly into the two plates 12. More precisely, each plate 12 presents a pair of substantially 'L' shaped projecting portions associated with its bottom edge and occupying substantially the same plane as the plate 12. The hooks 16 are provided by the projecting portions 17.

[0049] Advantageously, the trolley 9 is equipped with a plurality of wheels 19 running on a pair of parallel rails 20 in the base frame 50. Thus, the translational movement of the trolley 9 is suitably facilitated.

[0050] In the embodiment described and illustrated, the trolley 9 comprises four wheels 19 arranged in two pairs, one pair to each upright 10.

[0051] The trolley 9 is set in motion between the standby position and the operating position by suitable drive means 21. Such drive means 21 comprise at least one motor, denoted 22, and transmission components 23 by which the motor is connected to the trolley 9 and able thus to move the selfsame trolley along the rails (figure 9).

[0052] In the embodiment described, the drive means 21 of the trolley 9 comprise a chain 23a connected operatively to the motor 22 and fastened to the trolley 9, and a drive sprocket 23b meshing with the chain 23a.

[0053] The function of the translation component 7, as stated, is to transfer the first tray 2 from the operating position to the standby position.

[0054] In the embodiment illustrated, the translation component 7 comprises a conveyor 24 on which the first tray 2 is positioned. More precisely, and with reference in particular to figure 3, the conveyor 24 comprises a plurality of freely revolving rollers 25 disposed parallel one with another, on which the first tray 2 rests directly and is capable of movement. Similarly, the second tray 4 will rest directly on the rollers 25 when occupying the standby position.

[0055] The translation component 7 also comprises means 26 by which motion is induced in the first tray 2. By way of example, such means 26 might comprise a conveyor belt 27, or a chain (not illustrated), connectable to the first tray 2 in order to generate the translational movement, and set in motion by a motor 28.

[0056] In accordance with the invention, the machine manufacturing filters for tobacco products such as cigarettes will comprise at least one device 1 of the type thus described and illustrated.

[0057] To reiterate, the device 1 is installed immediately upstream of the production machine in question. In particular, the device 1 is placed directly opposite the infeed section of the machine, where filter material is drawn from the bale by the machine for the purpose of fashioning a continuous filter rod.

[0058] More exactly, the device 1 is positioned in alignment with the machine. In other words, both the first positioning direction D1 and the second positioning direction D2 are aligned on a predominating axis of the production machine.

[0059] In certain situations, the production machine in question will be a twin track filter maker. This signifies that the machine incorporates two production lines on which two distinct continuous filter rods are fashioned, advancing side by side, one independent of the other.

[0060] In this instance, the filter maker is equipped with a pair of devices 1 according to the present invention, positioned side by side, each aligned with a relative infeed section of the twin track machine.

[0061] The stated objects are achieved by the invention, which affords significant advantages.

[0062] In effect, as described and illustrated, the positions of the first tray and the second tray are switched simultaneously, causing the first tray (supporting the bale in depletion) to pass beneath the second tray (carrying the second bale, ready for use). In this way, the space needed for the purpose of replacing the bales is significantly reduced, given that there is no requirement for a temporary storage area in which to park the depleted bale during the changeover.

[0063] Moreover, precisely by virtue of the way in which the trays are manoeuvred, the changeover from one bale to another is distinctly faster than achievable with other prior art devices.

[0064] Lastly, with a device according to the invention for replacing bales of material supplied to a machine manufacturing tobacco products, such as filters, the bales are manoeuvred in a direction coinciding with the main axis of the machine.

[0065] In short, adopting the device disclosed, any positioning of the bales in a direction transverse to the axis of the filter maker is avoided. As a result, the filter maker and the associated device can be operated and managed more simply, and entirely in line.

Claims

1. A device for supplying material to a machine manufacturing tobacco products, **characterized in that** it comprises:

   - a first tray (2) holding material in the process of depletion, capable of movement from an operating position to a standby position;
   - a second tray (4) holding replacement material, capable of movement from the standby position to the operating position;
   - a handling component (6) by which the second tray (4) is lifted and translated from the standby

position to the operating position;
- a translation component (7) by which the first tray (2) is translated from the operating position to the standby position,
the handling component (6) further comprising an elevator (8) by which the second tray (4) is raised to a level higher than the first tray (2) and positioned directly over the first tray (2) during the movement from the standby position to the operating position.

2. A device as in claim 1, wherein the handling component (6) comprises a trolley (9) by which the elevated second tray (4) is translated from the standby position to the operating position; the elevator (8) being slidably associated with the trolley (9).

3. A device as in claim 2, wherein the trolley (9) comprises a pair of lateral uprights (10) translatable between the operating position and the standby position and supporting the elevator (8); at least the second tray (4) being located between the uprights (10).

4. A device as in claims 1 to 3, wherein the elevator (8) comprises a pair of plates (12) capable of movement on the trolley (9), each furnished with at least one hook (16) positioned to engage corresponding projections (18) presented laterally by at least the second tray (4).

5. A device as in claim 4, wherein each of the plates (12) presents at least one respective projecting portion (17) establishing the hook (16).

6. A device as in claim 5, wherein the plates (12) are associated slidably with the respective uprights (10) of the trolley (9).

7. A device as in claims 1 to 6, wherein the trolley (9) comprises a plurality of wheels (19) associated with a pair of mutually parallel rails (20), on which the trolley (9) is translatable between the operating position and the standby position.

8. A device as in preceding claims, wherein the translation component (7) comprises at least one conveyor (24) on which at least the first tray (2) is positioned.

9. A device as in preceding claims, wherein the translation component (7) engages the first tray (2) in such a way as to translate the selfsame tray (2) from the operating position to the standby position simultaneously with the activation of the handling component (6).

10. A device as in preceding claims, wherein the material supplied to the machine is placed on pallets.

11. A device as in preceding claims, wherein the material supplied to the machine consists in bales of filter material from which to manufacture filters for tobacco products.

12. A machine manufacturing filters for tobacco products, comprising at least one device as recited in the preceding claims.

FIG 1

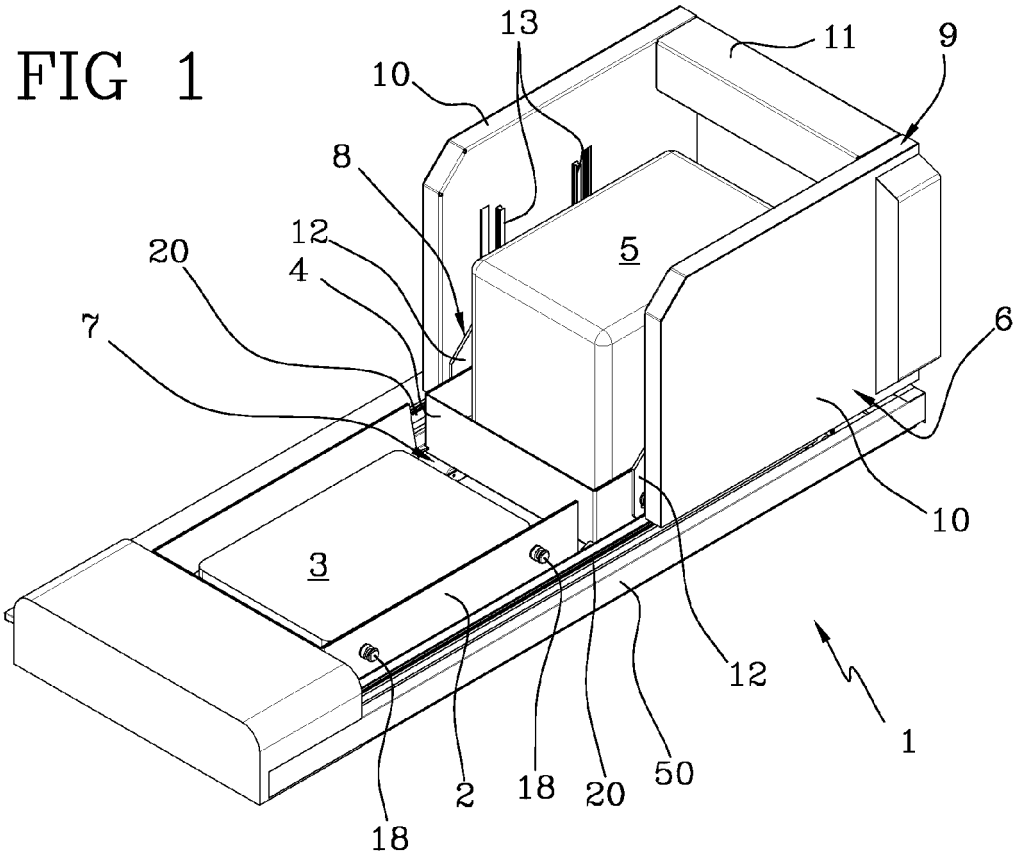

13
11
9
10
8
12
4
20
5
7
6
10
3
12
1
2
18
20
50
18

FIG 2

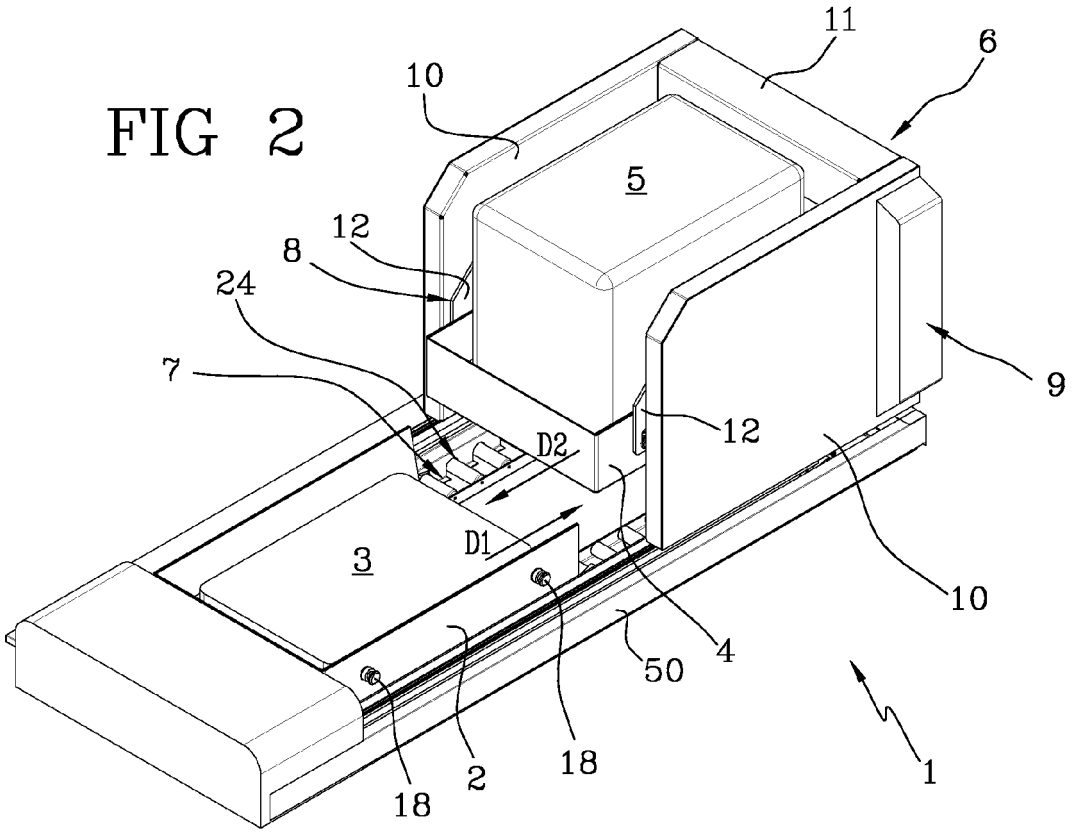

11
6
10
5
12
8
24
9
7
12
D2
D1
3
10
4
50
1
2
18
18

FIG 3

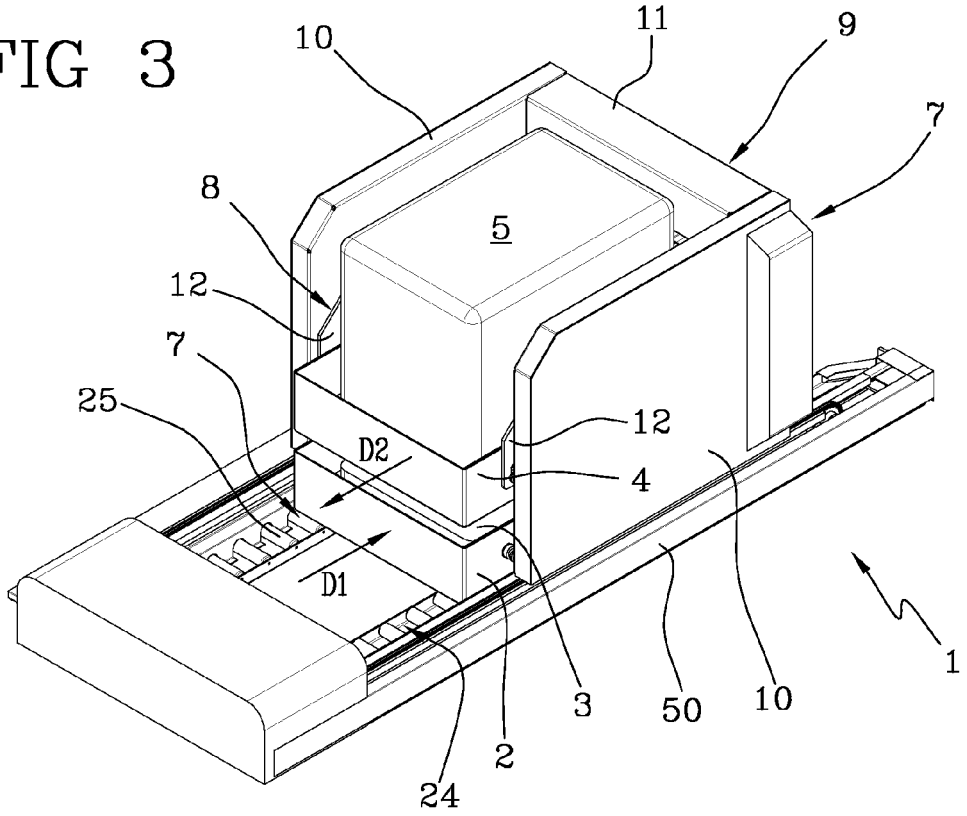

10
11
9
7
8
5
12
7
25
12
D2
4
D1
3
50
10
1
2
24

FIG 4

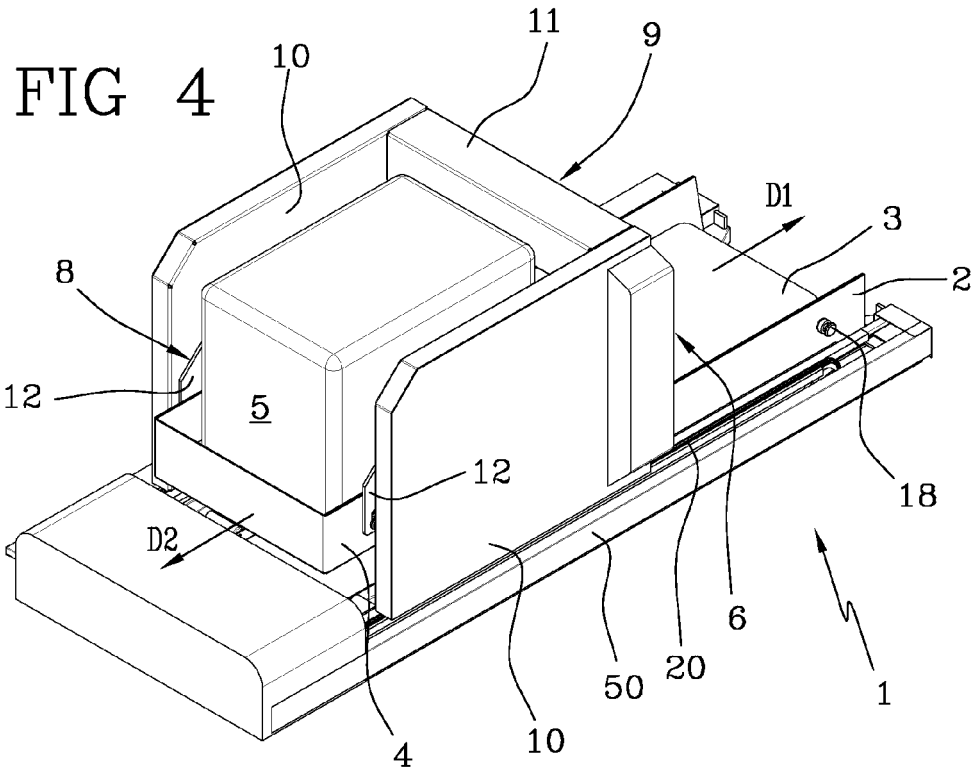

11
9
10
D1
3
2
8
12
5
12
18
D2
6
20
50
1
4
10

FIG 5

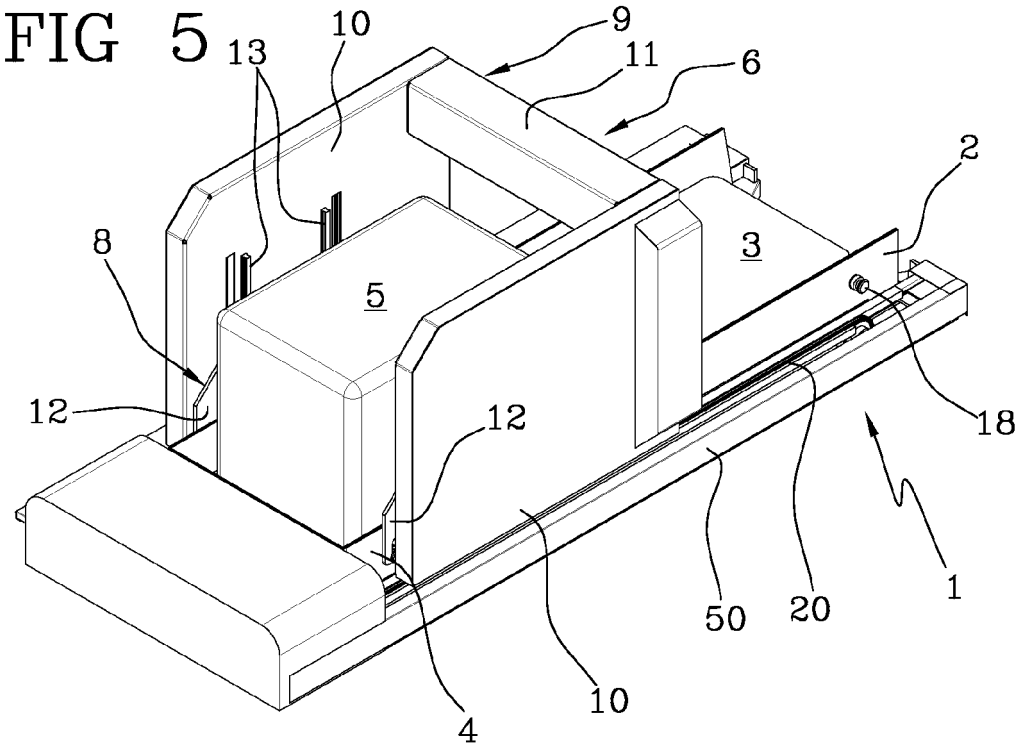

10
13
9
11
6
2
8
3
5
12
12
18
1
50
20
10
4

FIG 6

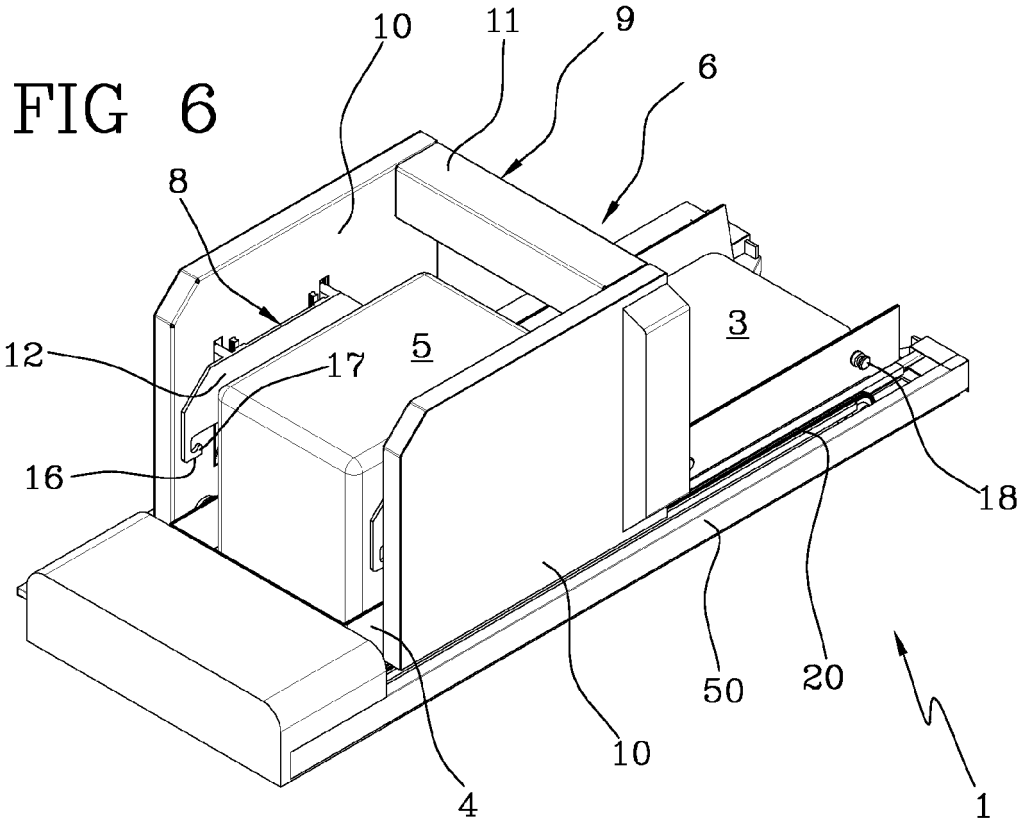

10
11
9
6
8
12
17
5
3
16
18
50
20
10
4
1

FIG 7

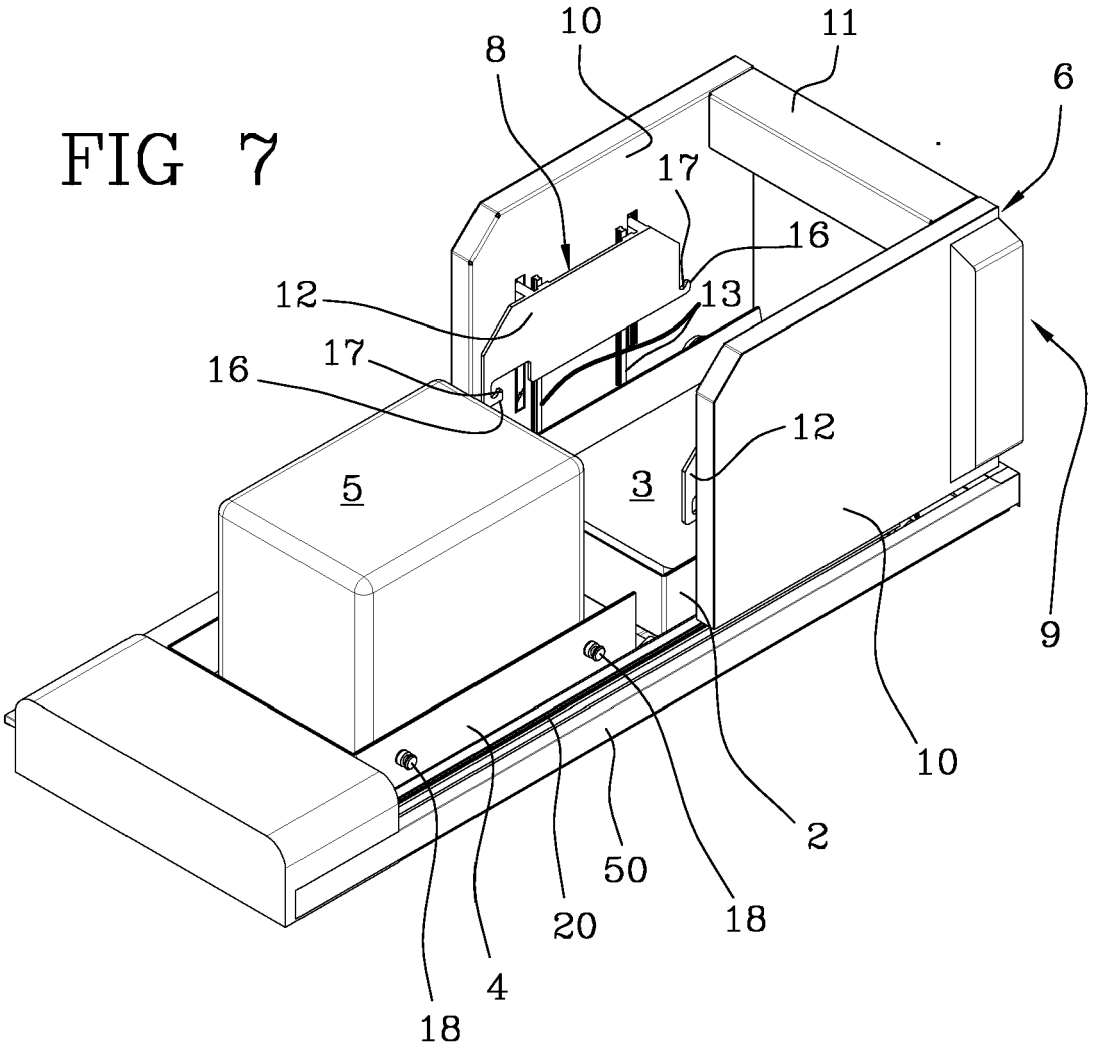


FIG 8

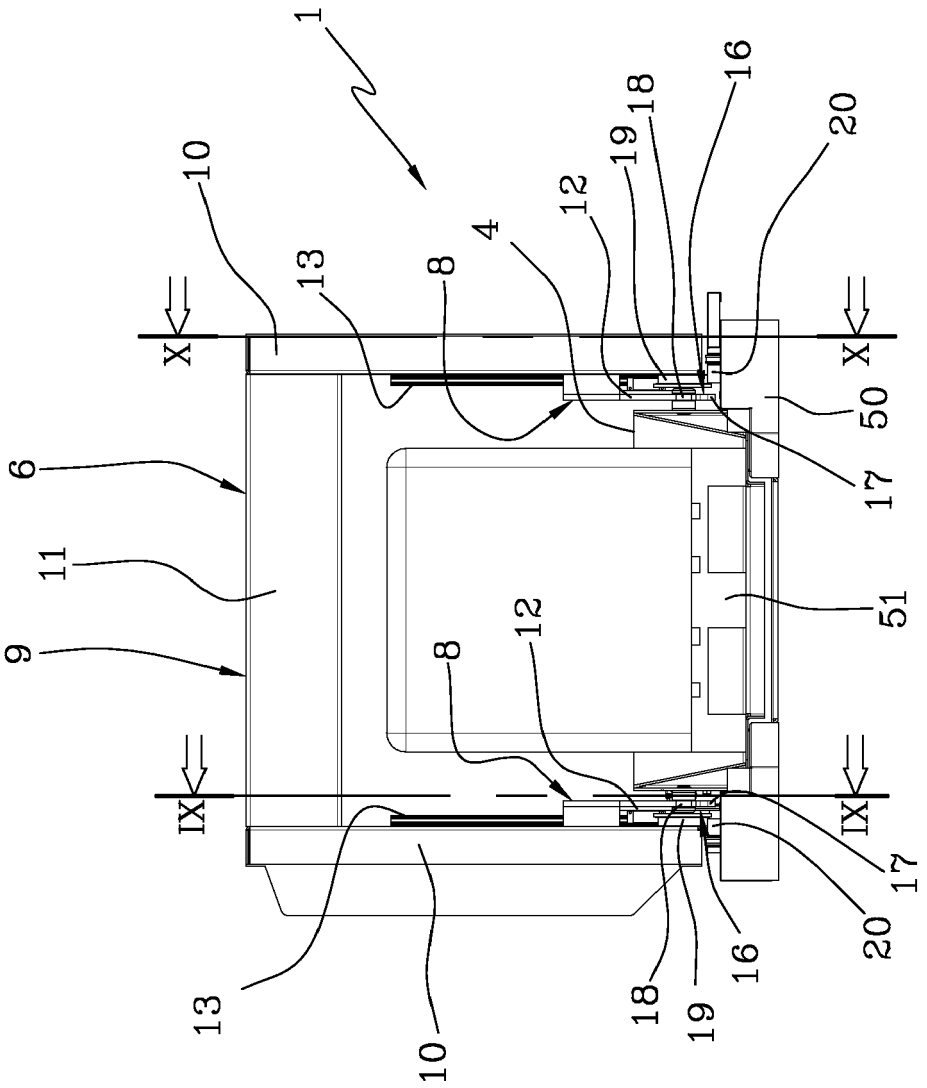

1
10
13
8
4
12
19
18
16
20
X
X
50
17
6
11
51
9
12
8
IX
IX
17
20
16
18
19
13
10

FIG 9

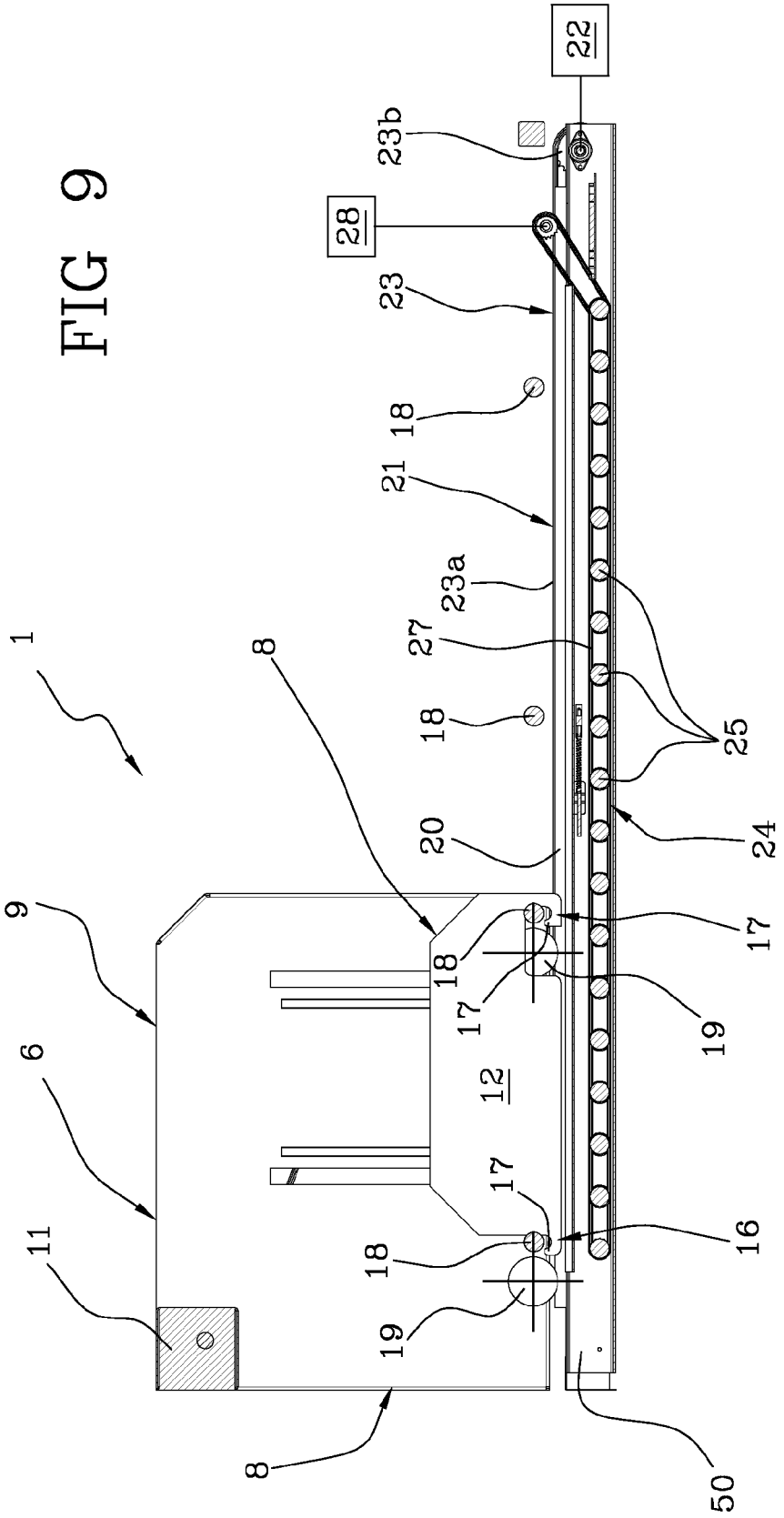
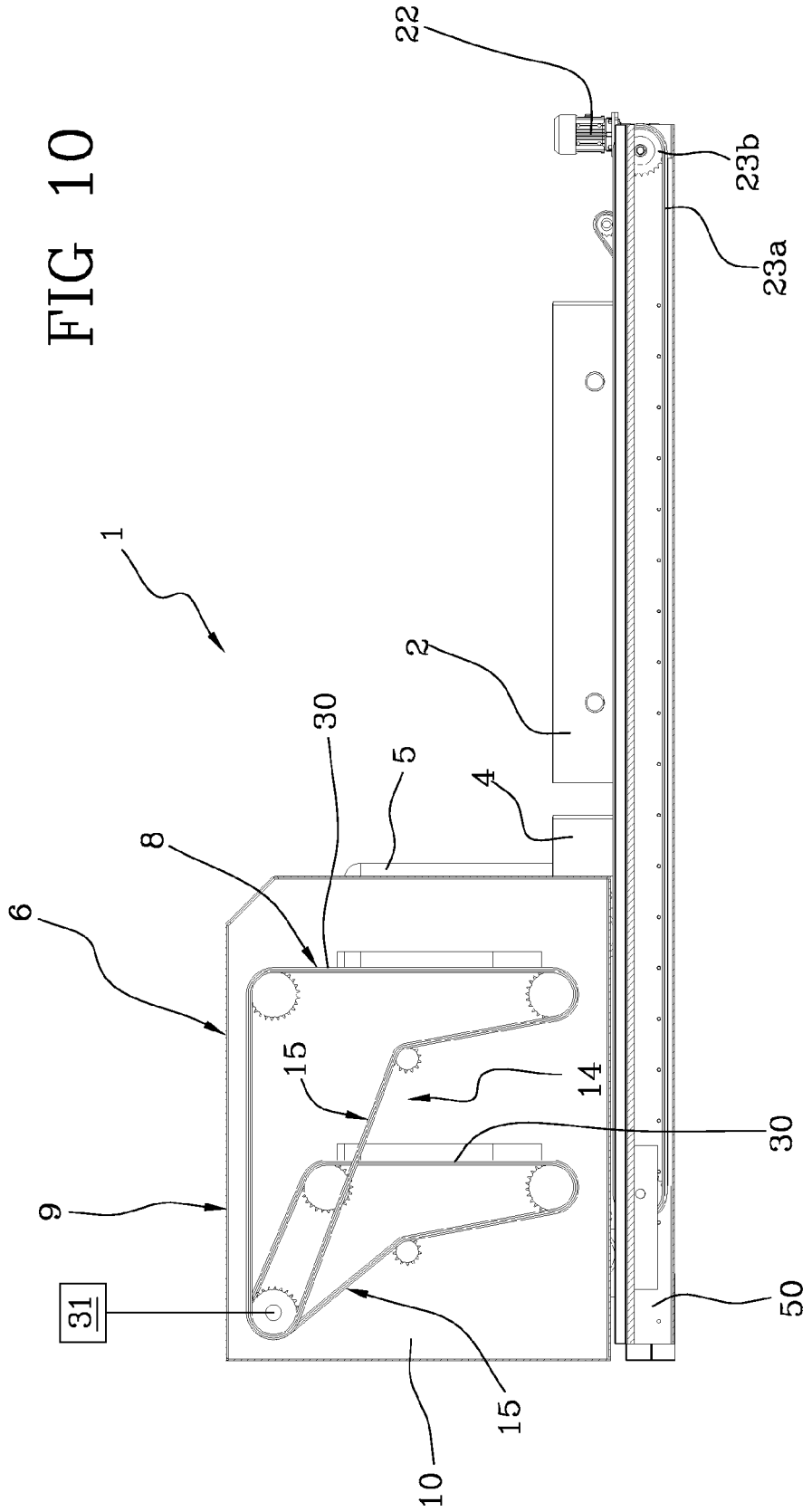

22
23b
28
23
18
21
23a
27
18
25
1
8
20
24
9
18
17
17
19
6
12
17
16
11
18
19
8
50

FIG 10



Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 10 16 5617

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 308 101 A1 (GD SPA [IT]) 7 May 2003 (2003-05-07) * paragraph [0028] - paragraph [0030]; figures *	1-12	INV. A24D3/02
A	US 2003/035708 A1 (DE JONG LEEN-PIETER [NL]) 20 February 2003 (2003-02-20)	1-12	
A	EP 1 508 520 A1 (HAUNI MASCHINENBAU AG [DE]) 23 February 2005 (2005-02-23) * paragraph [0014] - paragraph [0020]; figures *	1-12	
A	WO 2005/058077 A2 (HAUNI MASCHINENBAU AG [DE]; BUDNY PIOTR [DE]; KAEGELER PETER [DE]) 30 June 2005 (2005-06-30) * page 11, line 12 - page 12, line 29; figures *	1-12	
A	GB 2 249 533 A (KOERBER AG [DE]) 13 May 1992 (1992-05-13) * page 19, line 1 - page 22, line 23; figures *	1-12	TECHNICAL FIELDS SEARCHED (IPC) A24D A24C
A	EP 1 847 186 A1 (HAUNI MASCHINENBAU AG [DE]) 24 October 2007 (2007-10-24) * the whole document *	1-12	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 September 2010	Marzano Monterosso

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
P : intermediate document

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
L : document cited for other reasons

& : member of the same patent family, corresponding document

1 EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 16 5617

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-09-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1308101 A1	07-05-2003	IT BO20010657 A1	30-04-2003
		US 2003113195 A1	19-06-2003
US 2003035708 A1	20-02-2003	NONE	
EP 1508520 A1	23-02-2005	NONE	
WO 2005058077 A2	30-06-2005	CN 1882485 A	20-12-2006
		DE 10355876 A1	28-07-2005
		EP 1704105 A2	27-09-2006
		EP 2100834 A1	16-09-2009
		JP 4435172 B2	17-03-2010
		JP 2007512198 T	17-05-2007
		US 2007110546 A1	17-05-2007
GB 2249533 A	13-05-1992	NONE	
EP 1847186 A1	24-10-2007	CN 101057708 A	24-10-2007
		DE 102006018111 A1	25-10-2007

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82