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European Patent Office
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(11) **EP 4 544 923 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.04.2025 Bulletin 2025/18

(21) Application number: **23205430.4**

(22) Date of filing: **24.10.2023**

(51) International Patent Classification (IPC):
A24D 3/02 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A24D 3/0204; A24D 3/0229

(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 ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

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(54) A MANUFACTURING MACHINE FOR PRODUCING A STRAND OF MATERIAL FOR A SMOKING ARTICLE

(57) A manufacturing machine (100) for producing a strand of material (M) for a smoking article, wherein the manufacturing machine (100) comprises: two feeding units (101, 102) each of which is configured to feed a respective web material (M); a processing unit (103) configured to receive the web material (M) from a first feeding unit (101) or a second feeding unit (102) and to process the web material (M); and a forming unit (104) configured to receive the web material (M) from the processing unit (103) and to form a continuous material strand by gathering the web material (M); wherein the web material (M) is moved longitudinally along an advancing path (AP) defined between an inlet station (SI) arranged downstream of each feeding units (101, 102) and upstream of the processing unit (103) and an outlet station (SO) of the forming unit (104) in correspondence of which the continuous material strand exits from the manufacturing machine (100); wherein the advancing path (AP) defines an advancing direction (AD) of the web material (M).

The first feeding unit (101) is configured to feed the web material (M) along a first feeding direction (FD1) drawn it from at least one stack (1) and the second feeding unit (102) is configured to feed the web material (M) along a second feeding direction (FD2) drawn it from a bobbin. The machine comprises a switching unit (110) configured to switch selectively from the first feeding unit (101) to the second feeding unit (101); and vice versa.

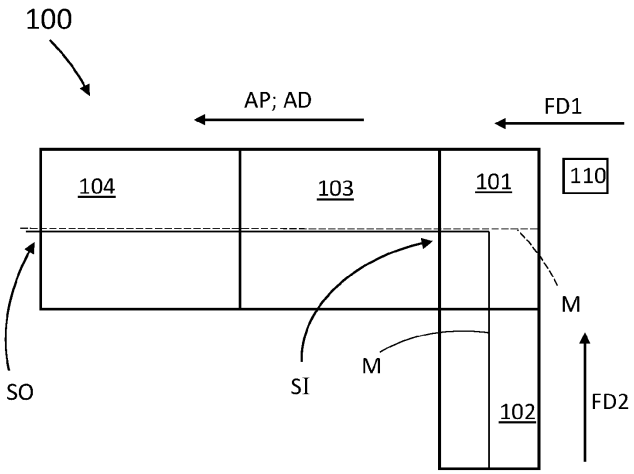

FIG. 1

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Description

PRIOR ART

[0001] In the tobacco industry, in particular in the field of filter making machines, typically a web material is fed by unwinding the web material itself from a bobbin. Bobbins are elements, wherein the web material is wound neatly on a core (generally made up of a tube) in shapes that vary, depending on the purpose, from cylindrical to truncated cone shape.

[0002] However, bobbins have the disadvantage that only a limited quantity (ion particular length) of web material can be wound on it. Therefore, many machine stops are requested for splicing the web material. During the splice of the material an end of the currently used bobbin is spliced with an end of a new bobbin which replace the bobbin that is about to end.

[0003] The splicing of the web material requires, however, unwanted machine downtimes, with a consequent drop in the productivity of the machine itself.

[0004] In addition, the products produced with the web material comprising the spliced portions of the two webs, are typically discarded.

DESCRIPTION OF THE INVENTION

[0005] The aim of the present invention is to provide a manufacturing machine for producing a strand of material for a smoking article, without the drawbacks described above and which is easy and economical to implement.

[0006] According to the present invention, a manufacturing machine for producing a strand of material for a smoking article, according to what is claimed in the appended claims is furnished.

[0007] The claims describe preferred embodiments of the present invention forming an integral part of the present description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The present invention will now be described with reference to the attached drawings, which illustrate some non-limiting embodiments thereof, wherein:

- Figures 1 to 3 are schematic plan views of different embodiments of a manufacturing machine according to the present invention; and
- Figures 4 to 6 are perspective views of transport supports configured for being fed to the manufacturing machine of figures 1-3.

PREFERRED EMBODIMENTS OF THE INVENTION

[0009] In Figure 1, number 100 denotes, as a whole, a manufacturing machine for producing a strand of material M for a smoking article, in particular for producing a subunit of the smoking article. Preferably, the manufacturing machine 100 is a filter making machine configured to produce at least a segment of a filter (subunit) of the smoking article. According to a possible alternative embodiment, the manufacturing machine is a maker machine configured to produce at least a segment (subunit) comprising tobacco or a substrate forming aerosol.

[0010] Preferably the subunit is achieved by cutting, in particular transversally (more in particular orthogonally to its longitudinal extension) a continuous material strand produced by the manufacturing machine 100.

[0011] The manufacturing machine 100 comprises two feeding units 101 and 102, a processing unit 103, a forming unit 104 and a switching unit 110.

[0012] The two feeding units 101 and 102 are each configured to feed a respective web material M, which is the same. The feeding units 101 and/or 102 can also act as a storage unit of the material M. In other words, the web material M is the same but a transporting support 105 or 106, on which the web material M is arranged, is different as disclosed in detail below.

[0013] In the attached figures, which are schematically, the fed web material M is illustrated as a line. It is understood that the fed web material M has dimensions (in particular thickness and depth; both measured orthogonal to its longitudinal extension L) which, on the contrary as illustrated, are not null.

[0014] The processing unit 103 is configured to receive the web material M from the feeding unit 101 or 102 and to process the web material M. In particular, the processing unit 103 is configured to subject the material M to treatments in preparation of its gathering for forming the continuous material strand (as disclosed in detail below). In particular, the processing unit 103 comprises a crimping device (of known type and not further described or illustrated). The crimping device is configured to provide the web material M with material weakenings, which are configured to promote the subsequent gathering of the material M in the forming unit 104. The material weakenings comprise: a plurality of folds and/or a plurality of cuts and/or incisions. In particular, the plurality of fold and/or the plurality of cuts and/or incisions extend parallel to the longitudinal extension of the material M or are arranged according to a predetermined pattern. In alterative, the cuts and/or incisions extend continuously or intermittently along the longitudinal or transversal extension of the material M.

[0015] The forming unit 104 is arranged downstream to the processing unit 103. The forming unit 104 is configured to receive the web material M from the processing unit 103 and to form a continuous material strand by gathering the web material M. The forming unit 104 comprises a forming device configured to form a continuous material strand by gathering the web material M received by the processing unit 103. The forming device is of the known type and comprises a forming beam configured to gather the web material M which passes into it and preferably to wrap the continuous material strand with a paper strip so as to achieve a wrapped

continuous material strand.

[0016] The web material M is moved longitudinally along an advancing path AP defined between an inlet station SI (arranged downstream of each feeding units 101 and 102 and upstream of the processing unit 103) in correspondence of which the web material M enters in the manufacturing machine 100 and an outlet station SO of the forming unit 104 in correspondence of which the continuous material strand exits from the manufacturing machine 100. The advancing path AP defines an advancing direction AD of the web material M. The feeding unit 101 is configured to feed the web material M along a feeding direction FD1 drawn it from at least one stack 1.

[0017] In particular, the feeding unit 101 comprises a first transport support 105 on which the web material M is stacked on at least one stack 1 (as schematically illustrated in figure 5). The web material M comprises a plurality of folds defined by folding lines 3 which extends transversally, in particular orthogonally, to the longitudinal extension of the web material M. Each fold is made in alternating opposite folding directions FD, so that two subsequent layers obtained by folding the web material M are parallel to each other. In other words, the material M, is "zig-zag" folded. Two subsequent layers obtained by folding the material M are superimposed on top of each other (figures 5 and 6). As illustrated in figure 6, the stacks 1 are arranged on the transport structure 105 configured to be fed to the manufacturing machine 100 of the tobacco industry. According to a possible embodiment, which is not limiting, the transport structure 105 is fed to the manufacturing machine 100 through a conveying unit 107 (illustrated schematically in figure 6). The longitudinal extension of the web material is parallel to the feeding direction FD1.

[0018] The feeding unit 102 is configured to feed the web material M along a feeding direction FD2 drawn it from a bobbin.

[0019] In particular, the feeding unit 102 comprises a transporting support 106 on which is arranged the bobbin of the web material M. The transporting support 106 is rotatable around a rotation axis transversal, in particular orthogonal, to the second feeding direction FD2.

[0020] The transporting support 106 is a different type from the transporting support 105.

[0021] Advantageously, but not limitedly, the transport support 105 being a pallet (also known as skid or storage rack). While the transport support 106 being a shaft for the bobbin (the web material M is wound neatly on a core).

[0022] The manufacturing machine 100 comprises the switching unit 110 configured to switch selectively from the feeding unit 101 to the feeding unit 102; and vice versa. Therefore, the manufacturing machine 100 is configured for selectively produce the material strand with the web material M fed by the feeding unit 101 or the feeding unit 102. The web material M fed by the feeding units 101 and 102 is of the same type but stored differently. In other words, the transporting supports 105 and 106 are different. In other words, what is different between the material M fed by the two feeding units 101 and 102 is not the material M per se but is the transport support on which it is arranged. According to a possible embodiment, which is not limitative, the switching unit 110 is an interface (in particular an input interface or an input-output interface) through which an operator can select which feeding unit 101 or 102 activate for feeding the material M on the respective transporting support 105 or 106 to the processing unit 103.

[0023] The web material M comprises at least one material chosen between: paper, cellulose, non-woven material, tobacco, a substrate for the aerosol formation or a combination of them. According to the embodiment illustrated in figures 1 and 2, which is not limitative, the feeding unit 101 is arranged parallel to the processing unit 103 so that a feeding direction FD1 of the feeding unit 101 is parallel, in particular aligned, to the advancing direction AD; while the feeding unit 102 is arranged transversally, in particular orthogonally, to the processing unit 103 so that a feeding direction FD2 of the feeding unit 102 is transversally, in particular orthogonally, to the advancing direction AD.

[0024] In other words, according to figures 1 and 2, the feeding unit 101 is arranged so that the feeding direction FD1 is parallel to the advancing direction AD. Furthermore, the feeding unit 102 is arranged so that the feeding direction FD2 is transversal, in particular orthogonal, to the advancing direction AD.

[0025] According to the embodiment of figure 2, which is not limitative, the manufacturing machine 100 comprises a buffer 108 (optional) arranged between the processing unit 103 and the feeding units 101 and 102. The buffer 108 is arranged aligned with the processing unit 103.

[0026] According to the illustrated embodiments of figures 1 and 2, which is not limitative, the feeding unit 101 is arranged upstream (with reference to the feeding directions FD1 and FD2) to the feeding unit 102, so that the feeding unit 101 is closer to the processing unit 103 than the feeding unit 102.

[0027] According to an alternative embodiment, which is not illustrated, the feeding unit 101 is arranged downstream (with reference to the feeding directions FD1 and FD2) to the feeding unit 102, so that the feeding unit 102 is closer to the processing unit 103 than the feeding unit 101. According to the embodiment of figure 3, which is not limitative, both feeding units 101 and 102 are arranged transversally, in particular orthogonally, to the processing unit 103, so that both feeding directions FD1 and FD2 of the feeding units 101 and 102 are transversally, in particular orthogonally, to the advancing direction AD. In other words, according to figure 3, the feeding unit 101 is arranged so that the first feeding direction FD1 is transversal, in particular orthogonal, to the advancing direction AD and the feeding unit 102 is arranged so that the feeding direction FD2 is transversal, in particular orthogonal, to the advancing direction AD.

[0028] According to the illustrated embodiments of figure 3, the feeding unit 101 is arranged downstream (with reference to the feeding directions FD1 and FD2) to the feeding unit 102, so that the feeding unit 102 is closer to the processing unit 103 than the feeding unit 101.

[0029] According to an alternative embodiment, which is not illustrated and is not limitative, the feeding unit 101 is arranged upstream (with reference to the feeding directions FD1 and FD2) to the feeding unit 102, so that the feeding unit 101 is closer to the processing unit 103 than the feeding unit 102.

[0030] The arrangement of the feeding units 101, 102, the processing unit 103 and the forming unit 104 showed in figures 1, 2, 3 is particularly advantageous. In particular, those arrangements allow to have a manufacturing machine 100 that takes up limited space.

[0031] Advantageously, but not limitedly, the manufacturing machine 100 comprising a guiding member 109 arranged between the processing unit 103 and both feeding units 101 and 102. The guiding member 109 is configured to guide the web material M during the direction change from an orthogonal orientation to the advancing direction AD to a parallel orientation to the advancing direction AD.

[0032] Advantageously, but not limitedly, the web material M fed by the feeding unit 101 is fed at a height from the floor (namely the dimension measured orthogonal to the floor on which the manufacturing machine 100 is arranged) which is higher than a height (measured in the same way) at which the web material M is fed by the feeding unit 102.

[0033] The invention described so far comprises a plurality of advantages.

[0034] Firstly, there is a redundancy in the feeding modes of the web material M. In particular, it is possible through the switching unit 110 to switch selectively from one feeding unit 101 to the other feeding unit 102, or vice versa, in an easy way, without requiring any effort.

[0035] It is possible to supply and stack only one of the transport supports 105 or 106 (with the material M arranged on it).

[0036] In addition, it is possible to feed eventual web material M fed from stacks 1 of material M alternating selectively by draw the material M from a stack 1 of the transport support 105 or by unwinding it from bobbins.

[0037] Secondly, the invention can also be easily implemented in pre-existing machines 100 without requiring major adaptation interventions, but simply by adding the feeding unit 101 or 102 and eventually the switching unit 110.

LIST OF FIGURE REFERENCE NUMBERS

[0038]

1 stack
3 folding line
100manufacturing machine
101feeding unit
102 feeding unit
103processing unit
104 forming unit
105transport support
106transport support
107 conveying unit
108 buffer
109 guiding member
110 switching unit
AP advancing path
AD advancing direction
FD folding direction
FD1feeding direction
FD2feeding direction
M material
SI inlet station
SO outlet station

Claims

1. A manufacturing machine (100) for producing a strand of material (M) for a smoking article, wherein the manufacturing machine (100) comprises:

   two feeding units (101, 102) each of which is configured to feed a respective web material (M);
   a processing unit (103) configured to receive the web material (M) from a first feeding unit (101) or a second feeding unit (102) and to process the web material (M); and a forming unit (104) configured to receive the web material (M) from the processing unit (103) and to form a continuous material strand by gathering the web material (M);
   the web material (M) is moved longitudinally along an advancing path (AP) defined between an inlet station (SI) arranged downstream of each feeding units (101, 102) and upstream of the processing unit (103), and an outlet station (SO) in correspondence of which the continuous material strand exits from the manufacturing machine (100); wherein the advancing path (AP) defines an advancing direction (AD) of the web material (M);
   wherein the first feeding unit (101) is configured to feed the web material (M) along a first feeding direction (FD1) drawn it from at least one stack (1) and the second feeding unit (102) is configured to feed the web material (M) along a second feeding direction (FD2) drawn it from a bobbin; and a switching unit (110) configured to switch selectively from the first feeding unit (101) to the second feeding unit (101); and vice versa.

2. The manufacturing machine (100) according to claim

1, wherein the first feeding unit (101) comprises a first transporting support (105) on which the web material (M) is stacked on the at least one stack (1); the web material (M) comprises a plurality of folds defined by folding lines (3) which extends transversally, in particular orthogonally, to the longitudinal extension of the web material (M); the longitudinal extension of the web material is parallel to the first feeding direction (FD1).

3. The manufacturing machine (100) according to claim 1 or claim 2, wherein: the second feeding unit (102) comprises a second transporting support (106) on which is arranged the bobbin of the web material (M); the second transporting support (106) is rotatable around a rotation axis transversal, in particular orthogonal, to the second feeding direction (FD2).

4. The manufacturing machine (100) according to any previous claim, wherein the second feeding unit (102) is arranged so that the second feeding direction (FD2) is transversal, in particular orthogonal, to the advancing direction (AD).

5. The manufacturing machine (100) according to any previous claim, wherein the first feeding unit (101) is arranged so that the first feeding direction (FD1) is parallel to the advancing direction (AD).

6. The manufacturing machine (100) according to any previous claim from 1 to 4, wherein the first feeding unit (101) is arranged so that the first feeding direction (FD1) is transversal, in particular orthogonal, to the advancing direction (AD).

7. The manufacturing machine (100) according to any previous claim, wherein the first feeding unit (101) is arranged upstream to the second feeding unit (102), so that the first feeding unit (101) is closer to the processing unit (103) than the second feeding unit (102).

8. The manufacturing machine (100) according to any previous claim from 1 to 6, wherein the first feeding unit (101) is arranged downstream to the second feeding unit (102), so that the second feeding unit (102) is closer to the processing unit (103) than the first feeding unit (101).

9. The manufacturing machine (100) according to any previous claim, comprising a buffer (108) arranged between the processing unit (103) and the feeding units (101, 102).

10. The manufacturing machine (100) according to any previous claim, wherein the web material (M) comprises at least one material chosen between: paper, cellulose, non-woven material, tobacco, a substrate for the aerosol formation or a combination of them.

11. The manufacturing machine (100) according to any previous claim, wherein the processing unit (103) comprises a crimping device configured to provide the web material (M) with material weakenings, which are configured to promote the subsequent gathering of the material (M) in the forming unit (104); wherein the material weakenings comprise:

a plurality of folds; and/or
a plurality of cuts and/or incisions; wherein the cuts and/or incisions extend continuously or intermittently along the longitudinal or transversal extension of the material (M).

12. The manufacturing machine (100) according to any previous claim, comprising a guiding member (109) arranged between the processing unit (103) and both feeding units (101, 102); the guiding member (109) is configured to guide the web material (M) during the direction change from an orthogonal orientation to the advancing direction (AD) to a parallel orientation to the advancing direction (AD).

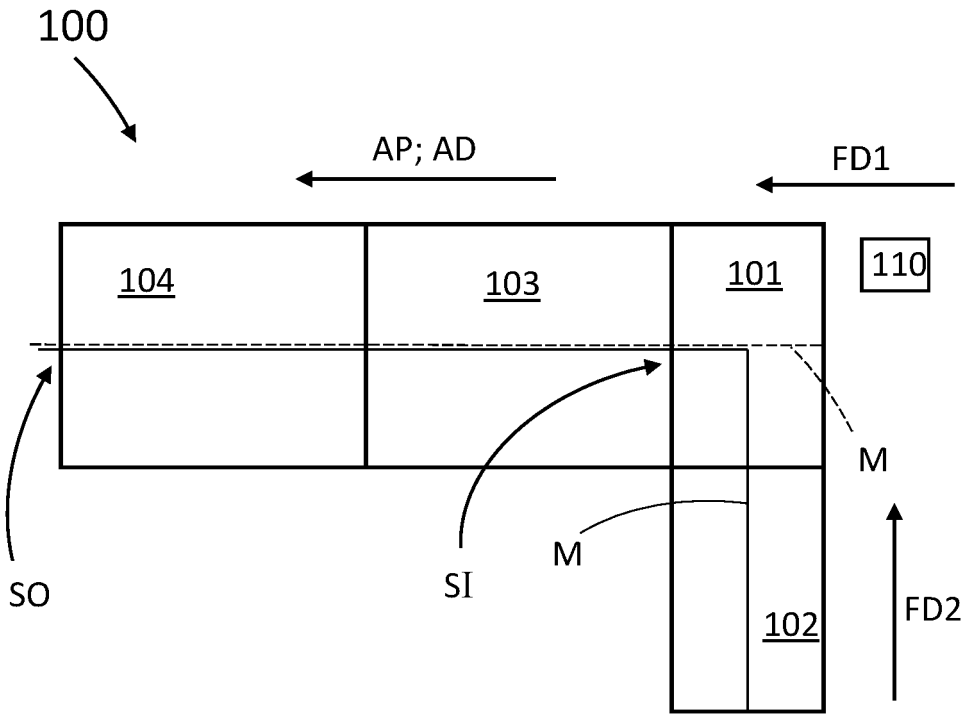
100
AP; AD
FD1
104
103
101
110
M
SO
SI
M
102
FD2

FIG. 1

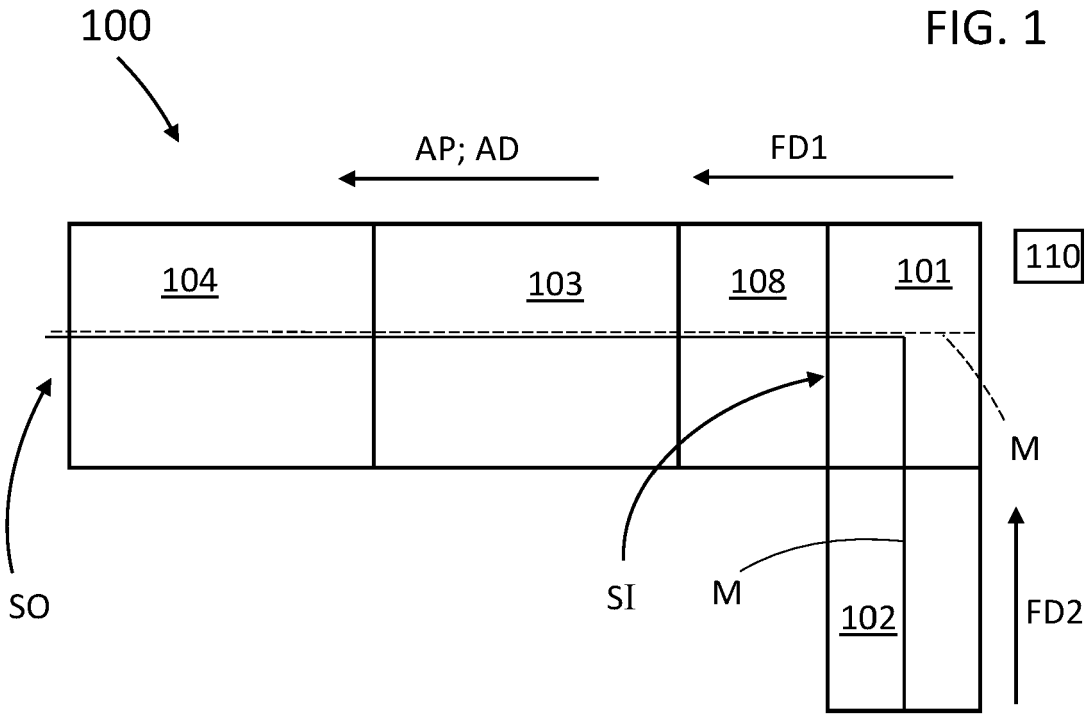
100
AP; AD
FD1
104
103
108
101
110
M
SO
SI
M
102
FD2

FIG. 2

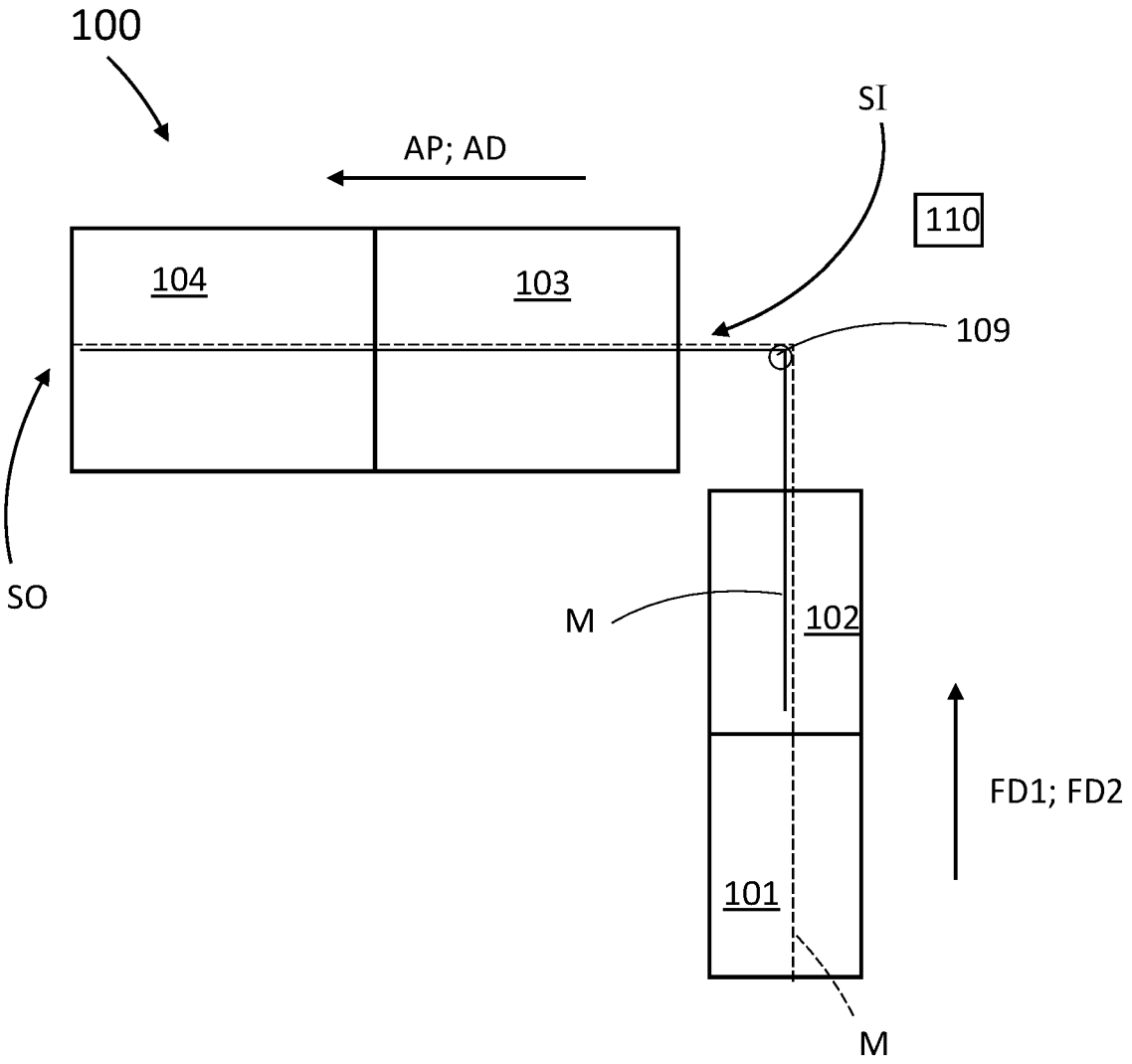

FIG. 3

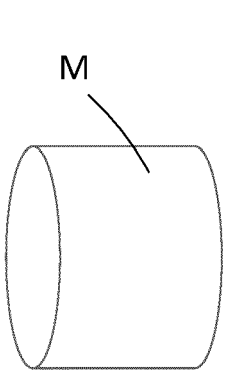

FIG. 4

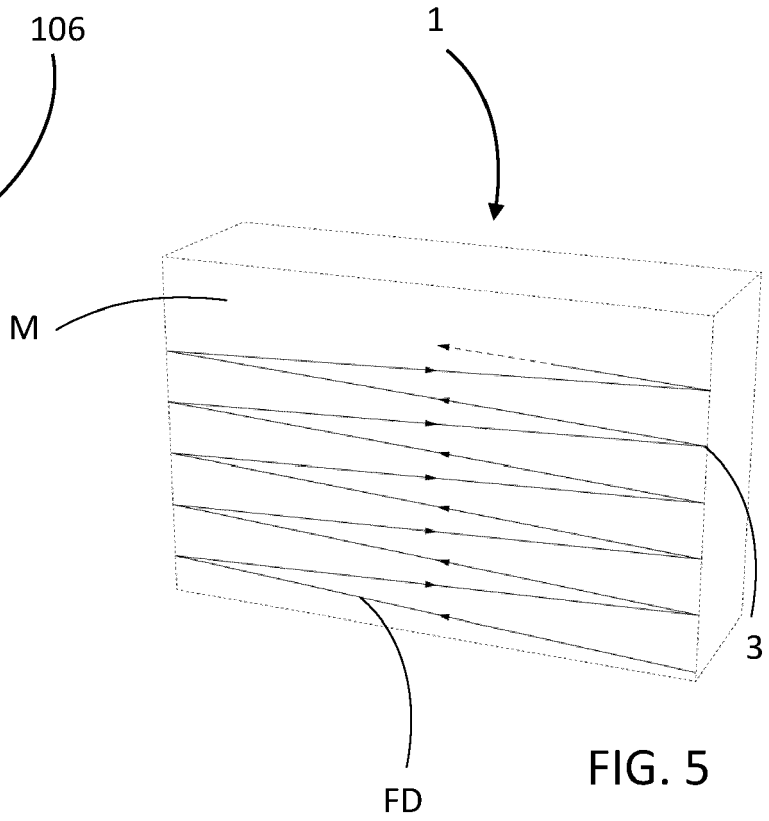

FIG. 5

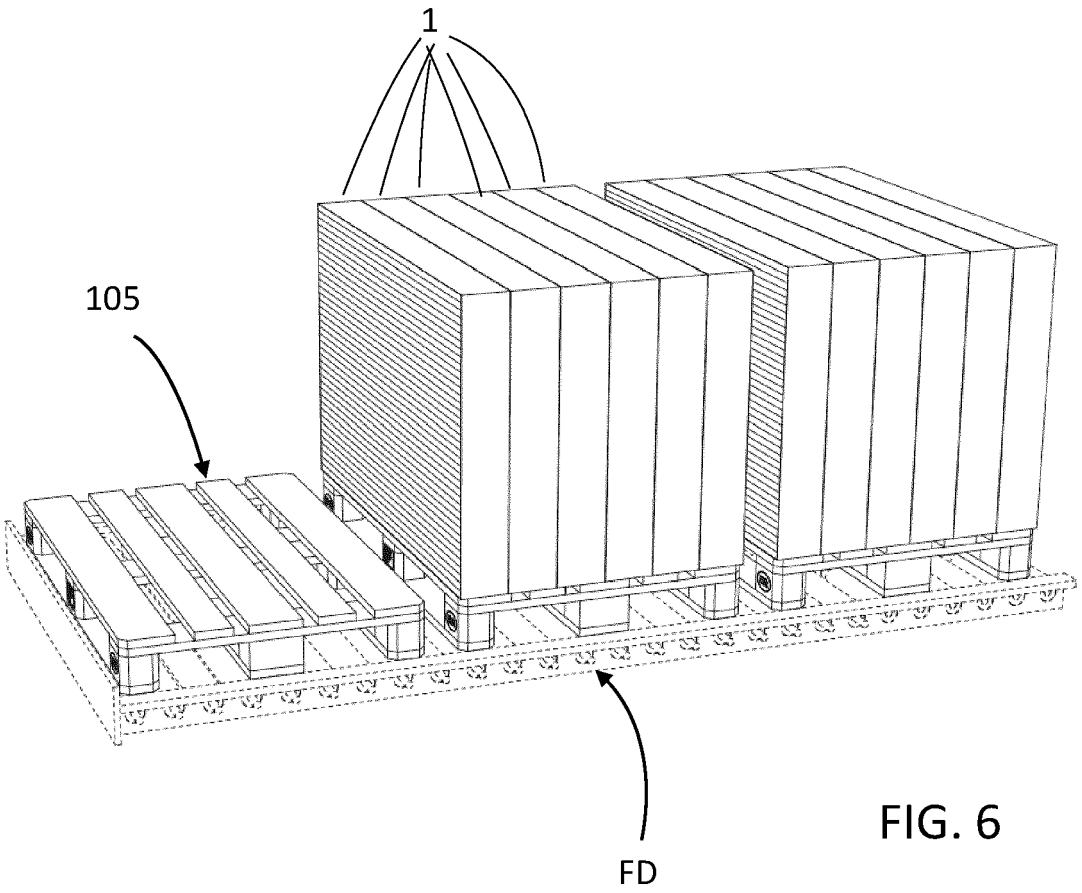

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
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A	GB 793 114 A (PETER HENRY JULIAN BYK) 9 April 1958 (1958-04-09) * page 1, line 81 - page 2, line 19 *	1-12	INV. A24D3/02
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			A24D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	6 March 2024	Cardan, Cosmin

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