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(54) **MANUFACTURING MACHINE FOR THE PRODUCTION OF SMOKING ARTICLES OR PARTS OF SMOKING ARTICLES**

(57) A manufacturing machine (1) for the production of smoking articles or parts of smoking articles and having: a preparation unit (2), in which a continuous cylinder (3) is produced; a feeding unit (6), which feeds a containing material web (5); a forming beam (4), in which the web (5) is bent in a tube shape around the cylinder (3); a first housing (11) designed to house a first gluing device (7), which is configured to lay a hot glue (9) on an edge of the web (5); and a second housing (12) designed to

house a second gluing device (8), which is configured to lay a cold glue (10) on the edge of the web (5). The first housing (11) and the second housing (12) are always both present, and always and only one gluing device (7, 8) is activated at a time in order to lay the hot glue (9) on the edge of the web (5) by means of the first gluing device (7) or, alternatively, the cold glue (10) is laid by means of the second gluing device (8).

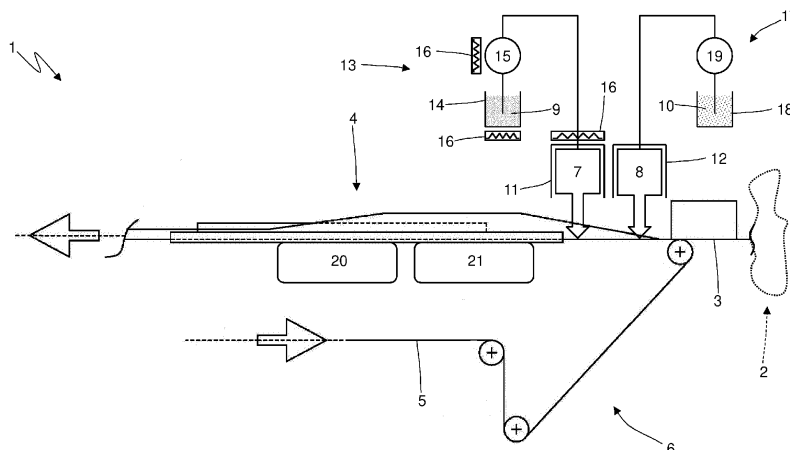


Fig. 1

**Description**CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** This patent application claims priority from Italian patent application no. 102020000020095 filed on 13/08/2020.

TECHNICAL FIELD

**[0002]** The present invention relates to a manufacturing machine for the production of smoking articles or parts of smoking articles and to the relative production method.

**[0003]** The present invention finds advantageous application to a manufacturing machine for the production of cigarette filters, to which the following disclosure will make explicit reference without thereby any loss of generality.

PRIOR ART

**[0004]** A manufacturing machine for the production of filters comprises (at least) one forming beam in which a continuous rod of filtering material is formed by wrapping a paper web in a tube shape around a continuous cylinder of filtering material. In other words, the continuous cylinder of filtering material is fed at the inlet of the forming beam over the paper web, which is subsequently bent in a tube shape along the forming beam. Before completing the bending in a tube shape of the paper web, a gluing device lays, to one edge of the paper web, a continuous strip of glue which can be a hot glue (i.e., a glue that has a temperature higher than room temperature and that must cool in order to set) or a cold glue typically vinyl based (i.e., a glue that is at room temperature and that must dry in order to set, i.e., must lose the volatile liquid components due to evaporation).

**[0005]** By way of example, the patent application EP1121869B1 describes an example of a gluing device for a manufacturing machine for the production of smoking articles or parts of smoking articles.

**[0006]** Generally, the type of glue that is used depends on the type of product that is packaged, therefore by varying the product that is packaged, the type of glue that is used can also vary. For example, hot glue is normally used for cellulose acetate-based filters, while cold glue can be used for paper filters, especially with an aim to produce biodegradable filters.

**[0007]** A high degree of adaptability is increasingly required for modern manufacturing machines, i.e., the ability to quickly change and with simple operations the type of product that is packaged; in this perspective it is necessary to be able to quickly change and with simple operations also the type of glue that is used in the manufacturing machine.

**[0008]** The patent applications EP3056097A1, EP2505269A2, US2004237972A1, EP1891865A1 and EP2505085A2 describe other examples of gluing devices

for laying glue during the production of smoking articles or parts of smoking articles.

DESCRIPTION OF THE INVENTION

**[0009]** The object of the present invention is to provide a manufacturing machine, and relative method, for the production of smoking articles or parts of smoking articles, which manufacturing machine allows to quickly and simply change the type of glue that is used when it is necessary to change the type of smoking articles or parts of smoking articles that is produced.

**[0010]** According to the present invention a manufacturing machine for the production of smoking articles or parts of smoking articles and the relative method according to what is claimed in the attached claims is provided.

**[0011]** The claims describe embodiments of the present invention forming an integral part of the present description.

BRIEF DESCRIPTION OF THE DRAWINGS

**[0012]** The present invention will now be described with reference to the attached drawings, which illustrate some non-limiting embodiments thereof, wherein:

- Figure 1 is a schematic view, and with the removal of parts for clarity, of a manufacturing machine made according to the present invention;
- Figures 2, 3 and 4 schematically illustrate the wrapping of a paper web around a continuous cylinder that takes place in the manufacturing machine of Figure 1;
- Figures 5 and 6 are two schematic views, and with the removal of parts for clarity, of the manufacturing machine of Figure 1 in two different configurations; and
- Figure 7 is a perspective view, and with the removal of parts for clarity, of the manufacturing machine of Figure 1 in an operating configuration that involves the use of cold glue.

PREFERRED EMBODIMENTS OF THE INVENTION

**[0013]** In Figure 1, number 1 denotes as a whole a manufacturing machine for the production of smoking articles (such as cigarettes containing tobacco) or parts of smoking articles (for example filters for traditional cigarettes or for new generation cigarettes).

**[0014]** The manufacturing machine 1 comprises a preparation unit 2 in which a continuous cylinder 3 (rod) of filtering material (or tobacco) is produced in a known manner and a forming beam 4 in which a paper web 5 (or other containment material) is wound in a tube shape around the continuous cylinder 3 fed by a feeding unit 6. In other words, at the inlet of the forming beam 4 the continuous cylinder 3 is fed above the paper web 5 which, along the forming beam 4, is subsequently bent in a tube

shape around the cylinder 3 itself (as illustrated in Figures 2, 3 and 4).

**[0015]** The manufacturing machine 1 comprises two gluing devices 7 and 8 which are placed side by side at a gluing station placed at the beginning of the forming beam 4 in an area in which the paper web 5 has not yet been bent in a tube shape around the cylinder 3 (as illustrated in Figure 3). The two gluing devices 7 and 8 operate alternatively, i.e., only one of the two gluing devices 7 and 8 is in operation while the other out of the two gluing devices 7 and 8 is deactivated.

**[0016]** Before completing the tube shape bending of the paper web 5, the gluing device 7 or the gluing device 8 lays a continuous strip of glue 9 or 10 to an edge of the paper web 5: the gluing device 7 lays a hot glue 9 (i.e., a glue that has a temperature higher than the room temperature and must cool in order to set) while the gluing device 8 lays a cold glue 10 typically vinyl based (i.e., a glue that has the room temperature and must dry in order to set i.e., it must lose the volatile liquid components by way of evaporation).

**[0017]** As illustrated in Figure 1, the manufacturing machine 1 comprises a housing 11 which is designed to house the gluing device 7 (configured to lay the hot glue 9 on the edge of the web 5) and a housing 12 which is designed to house the gluing device 8 (configured to lay the cold glue 10 on the edge of the paper web 5). The two housings 11 and 12 are placed side by side so as to be placed one after the other along the path followed by the paper web 5; in particular, the two housings 11 and 12 are placed rather close together (i.e., at a minimum distance so that the two housings 11 and 12 do not interfere with one another). Preferably, the housing 11 is placed downstream of the housing 12 with respect to the feeding direction of the paper web 5 (and of the continuous cylinder 3); then the gluing device 8 lays the cold glue 10 on the edge of the paper web 5 in an area which is further away from the forming beam 4 than an area in which the gluing device 7 lays the hot glue 9 on the edge of the paper web 5.

**[0018]** It is understood that the gluing devices 7 and 8 can be placed opposite one another (preferably one in front of the other), i.e., one on one side of the forming beam 4 and, the other, on the opposite side of the forming beam 4. In this embodiment, the housings 11, 12 are also placed opposite one another (preferably one in front of the other).

**[0019]** It should be noted that the term "housing" means an element capable of receiving and containing the respective gluing device 7, 8 and to which the gluing device 7, 8 is fixed (for example, by means of a system of screws and bolts or by interlocking). Alternatively, the term "housing" means an element to which the respective gluing device 7, 8 is fixed; in this embodiment the gluing device 7, 8 is not contained in the housing 11, 12 but is only supported by the same.

**[0020]** As previously stated, in use always and only one gluing device 7 and 8 is activated at a time so that

either the hot glue 9 is laid on the edge of the web 5 by means of the gluing device 7 or the cold glue 10 by means of the gluing device 8; even with these premises, the two housings 11 and 12 are always both present in the manufacturing machine 1 even if a housing 11 or 12 is empty (if the corresponding gluing device 7 or 8 is not present) or in any case houses the corresponding deactivated gluing device 7 or 8 (i.e., completely unused).

**[0021]** According to a possible embodiment, the housing 11 is movable between a work position, in which the gluing device 7 is placed close to the forming beam 4 so that it is capable of laying the hot glue 9 on the edge of the web 5, and a rest position (disengagement) in which the gluing device 7 is placed further away from the forming beam 4 compared to the work position and, hence, is not capable of laying the hot glue 9 on the edge of the web 5. Obviously, when the housing 11 is in the work position the gluing device 7 is necessarily always present (it makes no sense to place the empty housing 11 in the work position), while when the housing 11 is in the rest position the gluing device 7 can be present (i.e., housed in the housing 11) or even absent (i.e., the housing 11 is empty).

**[0022]** According to a possible embodiment, the housing 12 is movable between a work position, in which the gluing device 8 is placed close to the forming beam 4 in order to be able to lay the cold glue 10 on the edge of the web 5, and a rest position (disengagement), in which the gluing device 8 is placed further away from the forming beam 4 compared to the work position and, hence, is not capable of laying the cold glue 10 on the edge of the web 5. Obviously, when the housing 12 is in the work position the gluing device 8 is necessarily always present (it makes no sense to place the empty housing 12 in the work position), while when the housing 12 is in the rest position the gluing device 8 can be present (i.e., housed in the housing 12) or even absent (i.e., the housing 12 is empty).

**[0023]** According to various embodiments, neither of the two housings 11 and 12 is movable between the work position and the rest position, only the housing 11 is movable between the work position and the rest position, only the housing 12 is movable between the work position and the rest position, or both housings 11 and 12 are movable between the work position and the rest position.

**[0024]** According to the preferred embodiment (Figure 5), which provides that only the housing 11 is movable between the work position and the rest position. Said configuration makes it possible to advantageously keep the gluing device 7 (capable of laying hot glue) always mounted in the machine and to disassemble the gluing device 8 (capable of laying cold glue) when not in use: hot glue presents more cooling problems for disassembly and heating problems for starting and therefore it is advantageous to be able to keep the gluing device 7 always mounted in the machine whereas disassembling the gluing device 8 is less complicated.

**[0025]** From what has been described above, it is clear

that both gluing devices 7 and 8 can be housed in the respective housings 11 and 12 even if only one out of the two gluing devices 7 and 8 is used, or only the gluing device 7 or 8 that is used is housed in the respective housing 11 or 12.

**[0026]** As illustrated in Figure 1, the manufacturing machine 1 comprises a feeding system 13 which feeds the hot glue 9 to the housing 11 and is always present regardless of the presence or absence of the gluing device 7; i.e., the gluing device 7 could also be disassembled (or never mounted) on the manufacturing machine 1 whereas the feeding system 13 is in any case always present in the manufacturing machine 1. The feeding system 13 comprises a tank 14 which contains the hot glue 9 (the tank 14 could also be a disposable bin which can be replaced from time to time), a pump 15 which draws from the tank 14 to feed the hot glue 9 towards the housing 11, and a series of heating devices 16 which are operated to maintain the entire feeding system 13 (tank 14, pump 15, housing 11 and connection pipes) at a working temperature at which the hot glue 9 is sufficiently fluid.

**[0027]** As illustrated in Figure 1, the manufacturing machine 1 comprises a feeding system 17 which feeds the cold glue 10 to the housing 12 and is always present regardless of the presence or absence of the gluing device 8; i.e., the gluing device 8 could also be disassembled (or never mounted) on the manufacturing machine 1 whereas the feeding system 17 is in any case always present in the manufacturing machine 1. The feeding system 17 comprises a tank 18 which contains the cold glue 10 (the tank 18 could also be a disposable bin which can be replaced from time to time) and a pump 19 which draws from the tank 18 to feed the cold glue 10 towards the housing 12.

**[0028]** As illustrated in Figure 1, the manufacturing machine 1 comprises a cooling device 20 which is thermally coupled to the forming beam 4 to cool down the forming beam 4 and is used when the gluing device 7 lays the hot glue 9 on the edge of the web 5; in fact, the hot glue 9 must cool in order to set and therefore by cooling the forming beam 4 the setting of the hot glue 9 is accelerated. Furthermore, the manufacturing machine 1 comprises a heating device 21 which is thermally coupled to the forming beam 4 in order to heat the forming beam 4 and is used when the gluing device 8 lays the cold glue 10 on the edge of the web 5; in fact the cold glue 10 must dry, i.e., it must lose volatile liquid components by way of evaporation in order to set and therefore, by heating the forming beam 4, the drying (desiccation) of the cold glue 10 is accelerated thus consequently accelerating the setting of the cold glue 10.

**[0029]** With reference to the figures, it is specified that the cooling device 20 and the heating device 21 are illustrated in schematic and simplified form. The cooling device 20 is placed in the upper part of the forming beam 4, so as to act on the hot glue 9 once the paper web 5 has been bent in a tube shape around the cylinder 3 (Figure 4). Similarly, the heating device 21 is also placed

in the upper part of the forming beam 4, so as to act on the cold glue 10 once the paper web 5 has been bent in a tube shape around the cylinder 3 (Figure 4).

**[0030]** According to a possible embodiment, the forming beam 4 has one single seat which is designed to alternatively house either the cooling device 20 or the heating device 21; in this case, only one out of the cooling device 20 and the heating device 21 is present on board the manufacturing machine 1. According to a different embodiment, the forming beam 4 has two seats that are distinct and separate from one another and are designed to so that one houses the cooling device 20 and the other houses the heating device 21; in this case, both the cooling device 20 and the heating device 21 can (but do not necessarily have to) be present at the same time in the forming beam 4 (even if obviously it is always and only one out of the cooling device 20 and the heating device 21 to be activated). According to a further embodiment, a single thermal device is provided which is thermally coupled to the forming beam 4 and can alternatively be controlled to cool down the forming beam 4, when the gluing device 7 lays the hot glue 9 on the edge of the web 5, or to heat the forming beam 4 when the gluing device 8 lays the cold glue 10 on the edge of the web 5; i.e., the sole thermal device is capable of both heating and cooling (for example by using a reversible heat pump).

**[0031]** According to a possible embodiment, the manufacturing machine 1 comprises a forming beam 4 which is provided with the sole cooling device 20 and is mounted when the gluing device 7 lays the hot glue 9 on the edge of the web 5 and a different and alternative forming beam 4 which is provided with the sole heating device 21 and is mounted when the gluing device 8 lays the cold glue 10 on the edge of the web 5. Consequently, during a format change operation (i.e., an operation in which the manufacturing machine 1 is modified to vary the type of products that are made) which involves passing from hot glue 9 to cold glue 10 or vice versa, it is necessary also to replace the forming beam 4.

**[0032]** Figure 1 illustrates a configuration in which both gluing devices 7 and 8 are present at the same time (although obviously only one single gluing device 7 or 8 is activated at a time), Figure 5 illustrates a configuration in which only the gluing device 7 is present (whereas both housings 11 and 12 are still present and both feeding systems 13 and 17 which are never disassembled), and Figure 6 illustrates a configuration in which only the gluing device 8 is present (while, however, both housings 11 and 12 and both feeding systems 13 and 17 are present, which are never disassembled).

**[0033]** Figure 7 illustrates the manufacturing machine 1 in which the housing 11 (therefore the gluing device 7) is in the work position (and therefore it is active) while the housing 12 (therefore the gluing device 8) is in the rest position (and therefore it is deactivated).

**[0034]** The present invention also relates to the method for manufacturing smoking articles or parts of smoking

articles, comprising the steps of: preparing a continuous cylinder 3; feeding a containing material web 5; bending the web 5 around the cylinder 3; providing a first housing 11 designed to house a first gluing device 7 which is configured to lay a hot glue 9 on the edge of the web 5; providing a second housing 12 designed to house a second gluing device 8 which is configured to lay a cold glue 10 on the edge of the web 5. Furthermore, the method comprises the step of activating always and only one single gluing device 7, 8 at a time so that either the hot glue 9 is laid on the edge of the web 5 by means of the first gluing device 7 or, alternatively, the cold glue 10 by means of the second gluing device 8.

**[0035]** The embodiments described here can be combined with one another without departing from the scope of the present invention.

**[0036]** The manufacturing machine 1 described above has numerous advantages.

**[0037]** Firstly, the manufacturing machine 1 described above allows to substantially reduce the reconfiguration times and costs when it is necessary to pass from hot glue 9 to cold glue 10 or vice versa; i.e., the manufacturing machine 1 described above reduces to a minimum the time necessary to pass from hot glue 9 to cold glue 10 or vice versa. This result is obtained thanks to the fact that the housings 11 and 12 for the two gluing devices 7 and 8 and the feeding systems 13 and 17 are always present and are never disassembled. Particularly useful is the fact that the housing 11 or 12, (therefore the gluing device 7 or 8) not used, is placed in the rest position (disengagement) in order not to interfere in any way with the preparation and operation of the other gluing device 8 or 7 being used.

**[0038]** Furthermore, the manufacturing machine 1 described above is simple and inexpensive to manufacture.

#### LIST OF REFERENCE NUMBERS OF THE FIGURES

##### **[0039]**

1	manufacturing machine
2	preparation unit
3	continuous cylinder
4	forming beam
5	web of containing material
6	feeding unit
7	gluing device
8	gluing device
9	hot glue
10	cold glue
11	housing
12	housing
13	feeding system
14	tank
15	pump
16	heating device
17	feeding system
18	tank

19	pump
20	cooling device
21	heating device

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#### **Claims**

1. A manufacturing machine (1) for the production of smoking articles or parts of smoking articles and comprising:

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a preparation unit (2), in which a continuous cylinder (3) is produced;

a feeding unit (6), which feeds a containing material web (5);

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a forming beam (4), in which the web (5) is bent in a tube shape around the cylinder (3);

a first housing (11) designed to house a first gluing device (7), which is configured to lay a hot glue (9) on an edge of the web (5); and

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a second housing (12) designed to house a second gluing device (8), which is configured to lay a cold glue (10) on an edge of the web (5);

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the manufacturing machine (1) is **characterized in that:**

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the first housing (11) and the second housing (12) are always both present; and

always only one gluing device (7, 8) is activated at a time so that either the hot glue (9) is laid on the edge of the web (5) by

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means of the first gluing device (7) or, alternatively, the cold glue (10) is laid by means of the second gluing device (8).

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2. The manufacturing machine (1) according to claim 1, wherein the first housing (11) is movable between:

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a work position, in which the first gluing device (7) is placed close to the forming beam (4) so that it is capable of laying the hot glue (9) on the edge of the web (5); and

a rest position, in which the first gluing device (7) is placed further away from the forming beam (4) compared to the work position and, hence, is not capable of laying the hot glue (9) on the edge of the web (5).

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3. The manufacturing machine (1) according to claim 1 or 2, wherein the second housing (12) is movable between:

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a work position, in which the second gluing device (8) is placed close to the forming beam (4) so that it is capable of laying the cold glue (10) on the edge of the web (5); and

a rest position, in which the second gluing device (8) is placed further away from the forming beam

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- (4) compared to the work position and, hence, is not capable of laying the cold glue (10) on the edge of the web (5).
4. The manufacturing machine (1) according to claim 1, 2 or 3, wherein both gluing devices (7, 8) can be housed in the respective housings (11, 12) even if only one of the two gluing devices (7, 8) is used.
5. The manufacturing machine (1) according to claim 1, 2 or 3, wherein the only gluing device (7, 8) being used is housed in the respective housing (11, 12).
6. The manufacturing machine (1) according to one of the claims from 1 to 5 and comprising a first feeding system (13), which feeds the hot glue (9) to the first housing (11) and is always present regardless of the presence or absence of the first gluing device (7).
7. The manufacturing machine (1) according to one of the claims from 1 to 6 and comprising a second feeding system (17), which feeds the cold glue (10) to the second housing (12) and is always present regardless of the presence or absence of the second gluing device (8).
8. The manufacturing machine (1) according to one of the claims from 1 to 7 and comprising:
- a cooling device (20), which is thermally coupled to the forming beam (4) to cool down the forming beam (4) and is used when the first gluing device (7) lays the hot glue (9) on the edge of the web (5); and
- a heating device (21), which is thermally coupled to the forming beam (4) to heat the forming beam (4) and is used when the second gluing device (8) lays the cold glue (10) on the edge of the web (5).
9. The manufacturing machine (1) according to claim 8, wherein the forming beam (4) has one single seat, which is designed to alternatively accommodate either the cooling device (20) or the heating device (21).
10. The manufacturing machine (1) according to claim 8, wherein the forming beam (4) has two seats, which are distinct and separate from one another and are designed to accommodate, one, the cooling device (20) and, the other, the heating device (21).
11. The manufacturing machine (1) according to one of the claims from 1 to 7 and comprising a single thermal device, which is thermally coupled to the forming beam (4) and can alternatively be controlled either to cool down the forming beam (4), when the first gluing device (7) lays the hot glue (9) on the edge of
- the web (5), or to heat the forming beam (4), when the second gluing device (8) lays the cold glue (10) on the edge of the web (5).
12. The manufacturing machine (1) according to one of the claims from 1 to 11 and comprising:
- a first forming beam (4), which is mounted when the first gluing device (7) lays the hot glue (9) on the edge of the web (5); and
- a second forming beam (4), which is mounted when the second gluing device (8) lays cold glue (10) on the edge of the web (5).
13. A method to manufacture smoking articles or parts of smoking articles, comprising the steps of:
- preparing a continuous cylinder (3);
- feeding a containing material web (5);
- bending the web (5) around the cylinder (3);
- providing a first housing (11) designed to house a first gluing device (7), which is configured to lay a hot glue (9) on an edge of the web (5);
- providing a second housing (12) designed to house a second gluing device (8), which is configured to lay a cold glue (10) on an edge of the web (5);
- the method is **characterized in that** it comprises the step of activating always and only one gluing device (7, 8) at a time so that either the hot glue (9) is laid on the edge of the web (5) by means of the first gluing device (7) or, alternatively, the cold glue (10) is laid by means of the second gluing device (8).

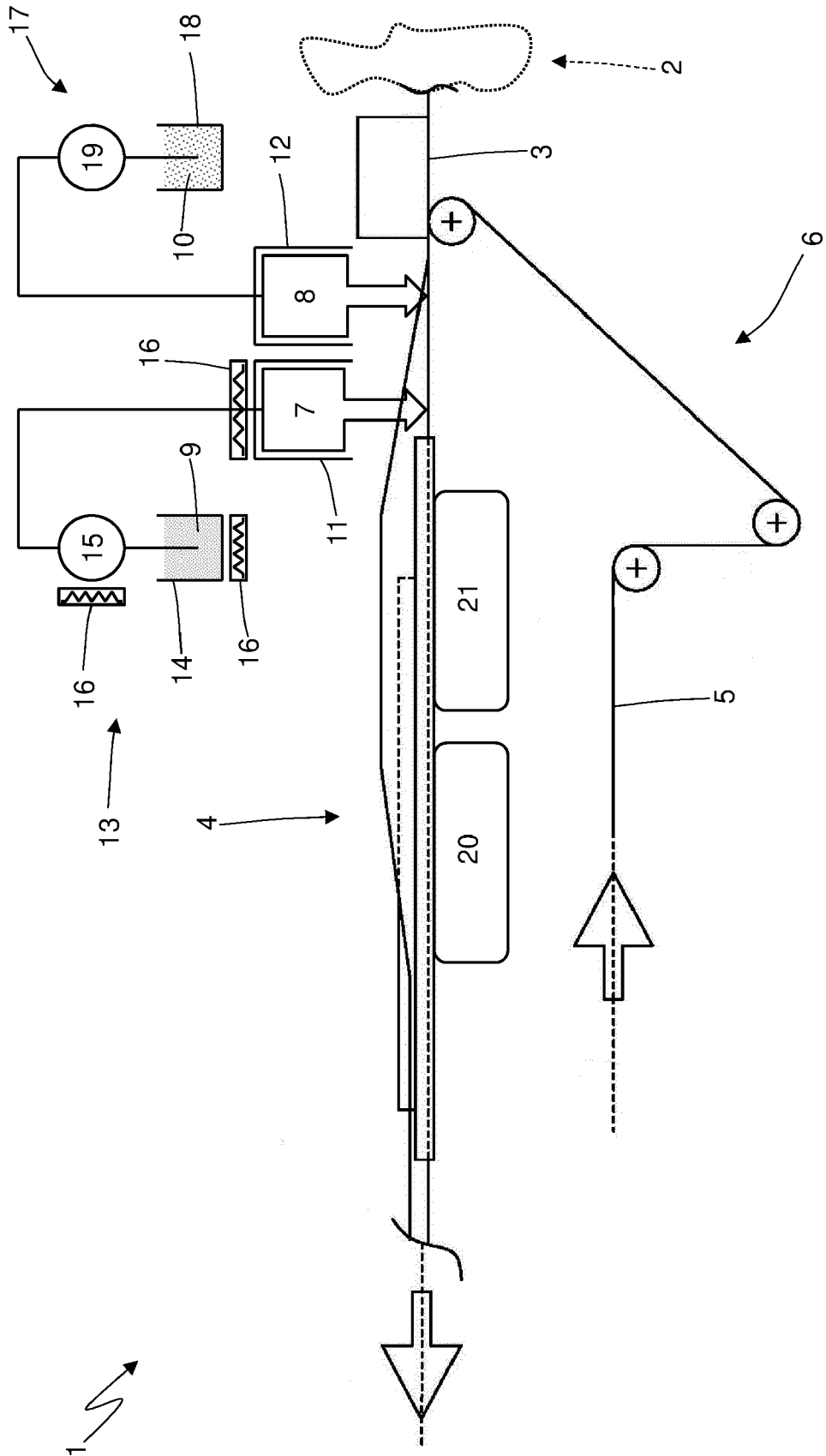


Fig. 1

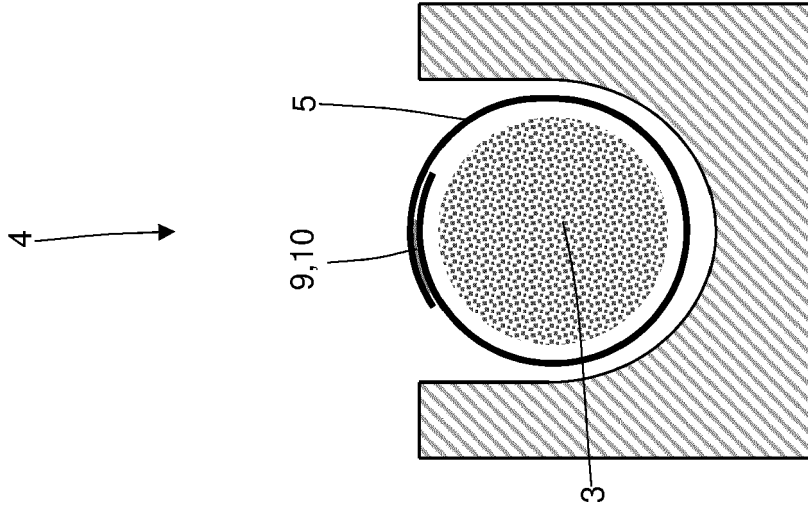


Fig. 2

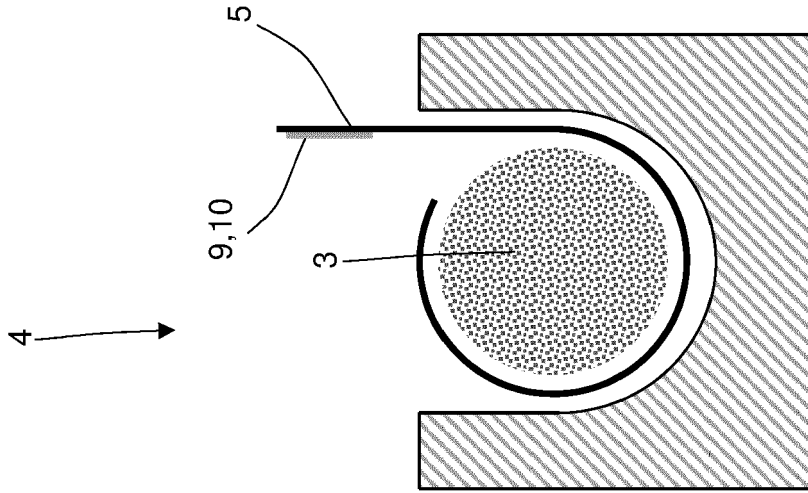


Fig. 3

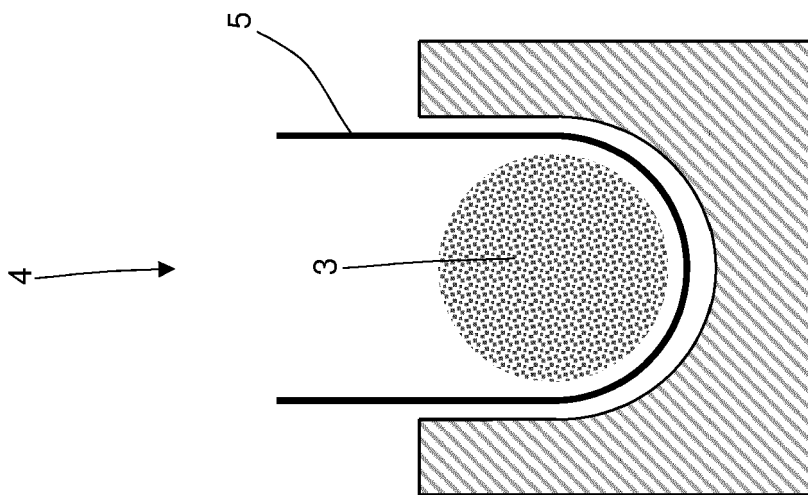


Fig. 4

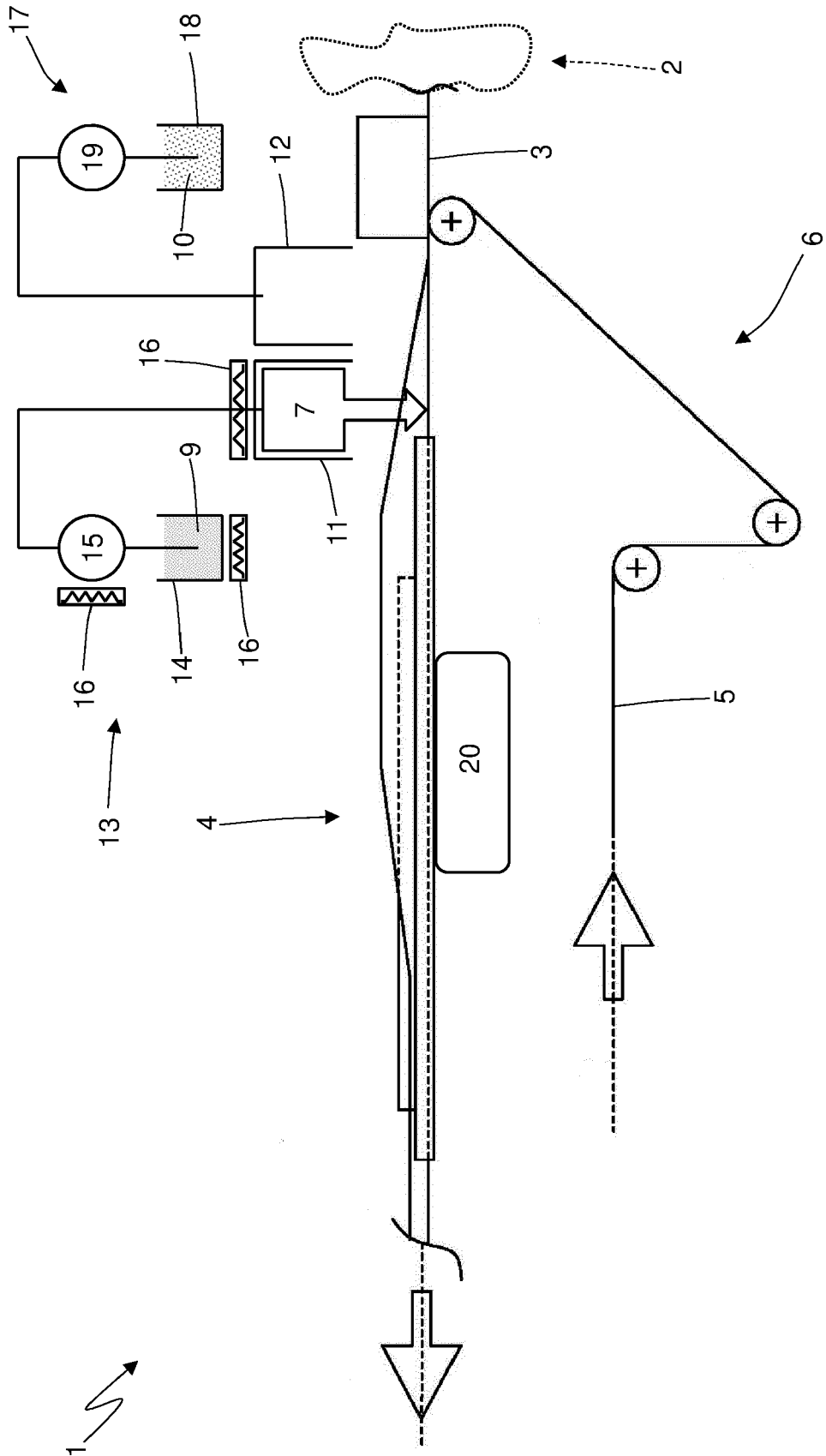


Fig. 5



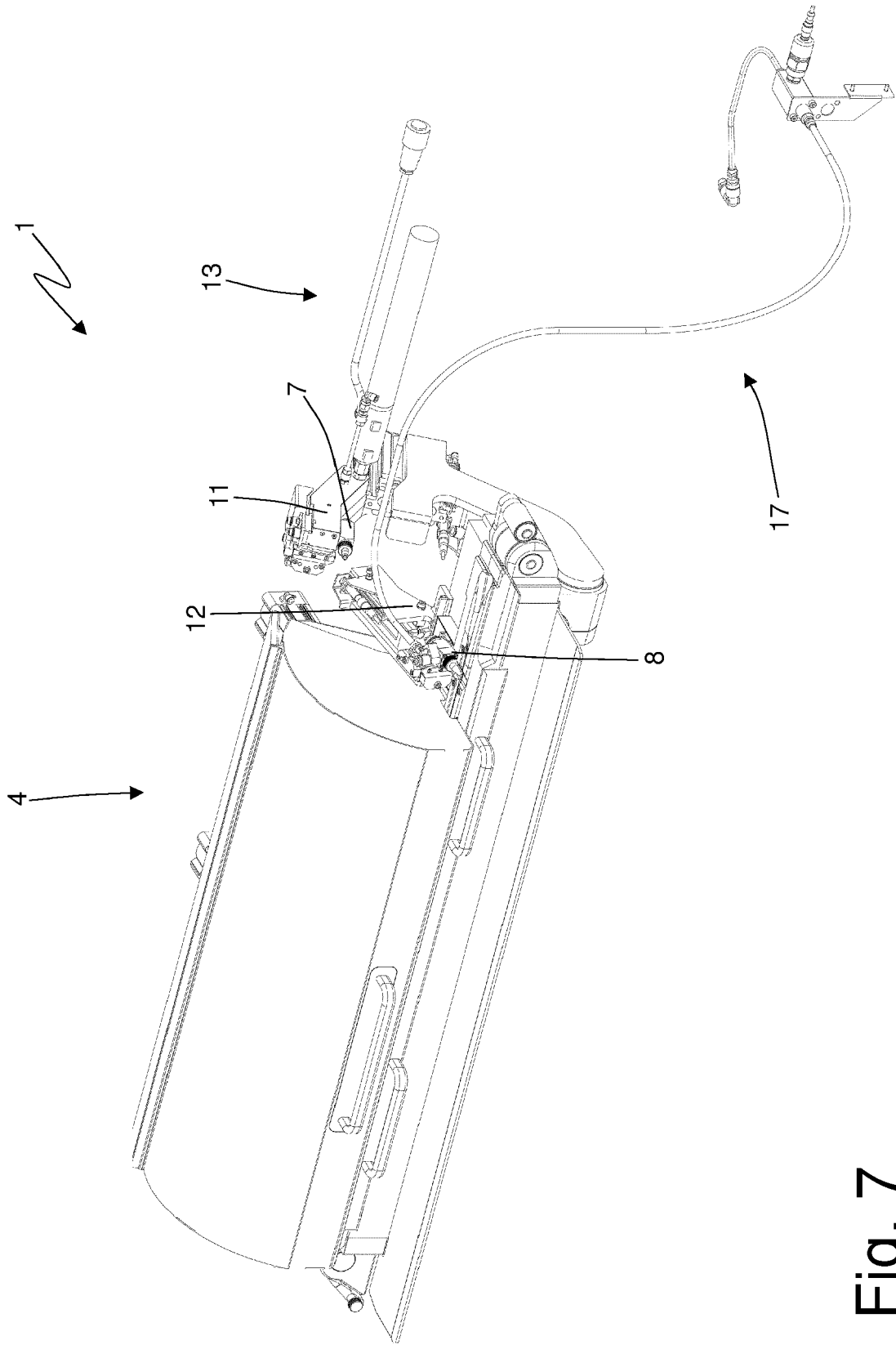


Fig. 7



EUROPEAN SEARCH REPORT

Application Number

EP 21 19 1253

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DOCUMENTS CONSIDERED TO BE RELEVANT

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 3 056 097 A1 (HAUNI MASCHINENBAU GMBH [DE]) 17 August 2016 (2016-08-17)	1-10,13	INV. A24D3/02
A	* paragraphs [0026], [0028], [0031], [0032], [0034]; figures 4, 6 * * paragraphs [0035], [0038] *	11,12	A24C5/24
X	EP 2 505 269 A2 (HAUNI MASCHINENBAU AG [DE]) 3 October 2012 (2012-10-03)	1-8,13	
A	* paragraphs [0003], [0004], [0026], [0027]; figure 1 *	9-12	
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X	EP 1 891 865 A1 (HAUNI MASCHINENBAU AG [DE]) 27 February 2008 (2008-02-27)	1,4-7,13	
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1 The present search report has been drawn up for all claims

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Place of search  
**Munich**

Date of completion of the search  
**12 January 2022**

Examiner  
**Schwarzer, Bernd**

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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

EPO FORM 1503 03:82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 21 19 1253

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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.

12-01-2022

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