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

(11) **EP 4 108 107 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.12.2022 Bulletin 2022/52

(21) Application number: **22180457.8**

(22) Date of filing: **22.06.2022**

(51) International Patent Classification (IPC):
A24C 5/47 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A24C 5/476

(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 RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **23.06.2021 IT 202100016409**

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(54) MACHINE AND METHOD FOR PRODUCING SMOKING ARTICLES HAVING A CAVITY

(57) A machine (1) for producing smoking articles (A) having a cavity, comprising:
- a picking drum (2) for conveying a full filter rod (S) having a multiple length;
- a first cutting assembly (3) for cutting the rod (S) into two filter units (F);
- a combining drum (4) that: receives two rods (T) comprising tobacco and the two filter units (F) between the two rods (T) comprising tobacco;
- separation means (5) for separating the filter units (F) from each other in such a way that an empty space (V) is formed between the two filter units (F);
- a wrapping unit (6) for completely wrapping with a wrap (I) the two filter units (F) and the empty space (V) and partially wrapping the two rods (T) comprising tobacco;
- a second cutting assembly (7) for cutting the wrapped wrap (I) at the empty space (V).

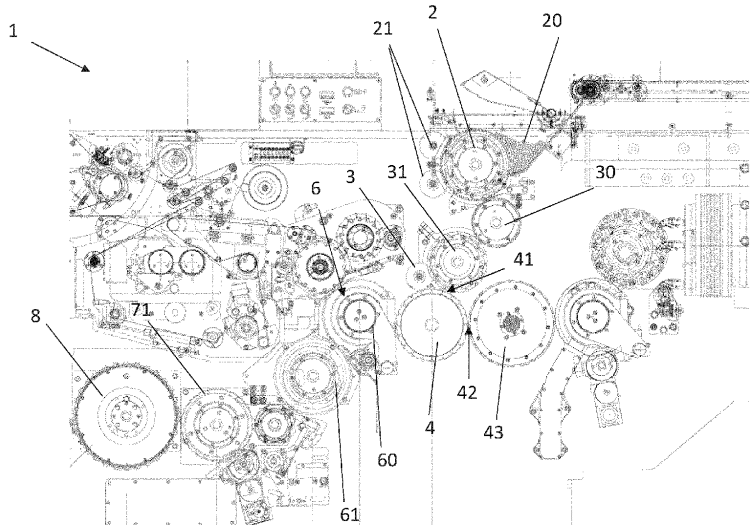

FIG.1

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Description

[0001] This invention addresses the technical sector of smoking articles having a cavity. In particular, this invention relates to a machine and a method for producing smoking articles having a cavity. This invention also relates to a method and a kit for modifying an existing machine for making smoking articles having a cavity.

[0002] It should be noted that the expression "smoking articles" is used to mean articles of various kinds such as, for example, traditional filter cigarettes or articles of the "heat not burn" type (HNB, where the article is only heated and not burnt), or rods, that is to say, sub-units of these articles.

[0003] Known in the prior art are smoking articles provided with a cavity, for example cigarettes comprising a cavity at the respective filter.

[0004] To make filter cigarettes of this kind, the cigarette rods are joined to filter plugs which are already provided with a cavity and which are then cut.

[0005] In particular, the filter plugs with cavity are made in a specific machine, known as combiner, which assembles all the different filter rods, alternating them with cavities, to form a filter plug.

[0006] These machines are cost- and time-intensive.

[0007] This invention has for an aim to overcome the above mentioned drawbacks.

[0008] This aim is achieved by a machine and a method for producing smoking articles having a cavity according to the appended claims, and by a method and a kit for modifying an existing machine for producing smoking articles having a cavity.

[0009] Advantageously, this invention allows smoking articles having a cavity to be made in a particularly simple, quick and inexpensive manner compared to the prior art.

[0010] These and other advantages are more apparent in the description which follows, with reference to the accompanying drawings, in which:

- Figure 1 is a partial side view of a machine according to this invention;
- Figures 2-9 illustrate respective steps of a method according to the invention.

[0011] With reference to the accompanying drawings, the numeral 1 denotes a machine for making smoking articles having a cavity according to this invention.

[0012] It should be noted that the expression "smoking articles" is used to mean articles of various kinds such as, for example, traditional. filter cigarettes or articles of the "heat not burn" type (HNB, where the article is only heated and not burnt), or rods, that is to say, sub-units of these articles. Figures 2-9 show filter cigarettes during the steps in their production.

[0013] With reference to Figure 1, the machine 1 according to the invention comprises: a picking drum 2 having at least one seat (preferably a plurality of seats) for conveying a full filter rod S (that is, a rod without a cavity) having a multiple length (for example, a quadruple length) along a path); and a first cutting assembly 3 (comprising at least one blade) for cutting the full filter rod S having a multiple length into two filter units F (preferably identical). The machine 1 also comprises a combining drum 4 that: receives in a seat of it two rods T comprising tobacco axially aligned and spaced from each other, and receives, in the same seat, the two filter units F interposed between the two rods T comprising tobacco.

[0014] The machine 1 also comprises separation means 5 (see Figures 2-4) downstream of the first cutting assembly 3 (preferably associated with the combining drum 4, as in the case illustrated) for separating the filter units F from each other in such a way that each one contacts a rod T comprising tobacco (at the respective ends thereof) and in such a way that an empty space V is formed between the two filter units F. The empty space V between the two filter units F (distance) is equal to the longitudinal dimensions of the two cavities C to be obtained (one for each smoking article A, preferably identical to each other).

[0015] The machine 1 also comprises a wrapping unit 6 for completely wrapping with a wrap I the two filter units F and the empty space V between the filter units F and partially wrapping the two rods T comprising tobacco for connecting them to the filter units F (this being the operation known as "rolling", see Figures 6 and 7).

[0016] The machine 1 also comprises a second cutting assembly 7 for transversally cutting the wrapped wrap I at said empty space V in such a way as to define a cavity C for each filter unit F wrapped by the wrap I and adjacent to the filter unit F. Refer to Figure 8, where a cutting line 70 is represented as a solid line. The cavity C, on the other hand, is shown in Figures 7-9.

[0017] Advantageously, the machine 1 according to the invention allows smoking articles A having a cavity C to be made without using a dedicated machine 1 (combiner) to form the filter plugs provided with cavities. The machine 1 according to the invention is therefore economical and structurally simple compared to prior art solutions.

[0018] In the embodiment illustrated, as mentioned, the separation means 5 are associated with the combining drum 4 (that is to say, they operate in proximity thereto or are part of it); alternatively, the separation means 5 might be associated with a different drum that is also downstream of the first cutting assembly 3 and upstream of the unit for feeding the wrap I.

[0019] Preferably, the separation means 5 comprise pneumatic means (air taken in or blown out).

[0020] For example, the separation means 5 comprise at least two suction supports 50, arranged at the seat and configured for axially moving each filter unit F in such a way that the empty space V is arranged between the two filter units F (see Figures 2-4).

[0021] In a variant not illustrated, the separation means 5 comprise at least two motorized rollers, arranged externally to the combining drum 4, each being able to ax-

ially move a filter unit F in such a way that the empty space V is arranged between the two filter units F.

[0022] The machine 1 according to the embodiment of Figure 1 is described below in its entirety.

[0023] A mass of full filter rods S of multiple (for example, quadruple) length is contained in a hopper 20 which has a bottom outlet opening coupled to the picking drum 2 (which has peripheral suction seats for the filter rods S of multiple length).

[0024] The picking drum 2 acts in conjunction with cutting means 21 (in this case comprising two rotary blades) for cutting the full filter rods S of multiple length transversally so as to obtain double-length filter rods S, as described above.

[0025] The double-length filter rods S are transferred from the picking drum 2 to a transit drum 30 which is provided with peripheral suction seats.

[0026] From the transit drum 30, the double-length filter rods S are transferred to a first cutting drum 31 which is provided with peripheral suction seats and which acts in conjunction with the first cutting assembly 3 (comprising a rotary blade) which cuts each filter rod S into two filter units F (preferably identical).

[0027] From the cutting drum 31, the separate but axially adjacent filter units F are then transferred to a first infeed station 41 of the combining drum 4 provided with peripheral suction seats. At a second infeed station 42 of the combining drum 4, arranged downstream of the first infeed station 41 along a feed path, two rods T comprising tobacco are fed into each seat (by a feed drum 43) in such a way that the rods are axially aligned, axially spaced and external to the filter units F. The filter units F and the rods T containing tobacco are all axially aligned (since they are housed in the same seat).

[0028] Operating at the combining drum 4 there are separation means 5 which separate the filter units F from each other by spacing them axially in such a way that each of them (with a respective end of it) contacts a rod T comprising tobacco and in such a way that an empty space V is formed between the two filter units F. Thus, each seat contains a group G formed of two rods T comprising tobacco, two filter units F and an empty space V between the filter units F.

[0029] The groups G thus formed are transferred to a coupling drum 60 provided with peripheral suction seats for the groups. Operating at the coupling drum 60 there is a feed unit for feeding a wrap I (a connecting strip which is gummed, that is, provided with adhesive) for each group G and for applying it as described above (so as to wrap completely the two filter units F and the empty space V between the filter units F and partially the two rods T comprising tobacco in order to connect them to the filter units F).

[0030] From the coupling drum 60, the groups G provided with the wraps I are transferred to a rolling drum 61 where wrapping around the groups G is completed by the wrapping unit 6.

[0031] Lastly, the machine 1 comprises a second cutting drum 71, where a second cutting assembly 7 cuts each group G (preferably centrally) where the empty space V between the two filter units F is, to form two juxtaposed smoking articles A (in the case illustrated, filter cigarettes) having a cavity C.

[0032] The end section of the machine 1 comprises a tip-turning drum 8, where what is known as "tip-turning" occurs, to pass from two juxtaposed rows of smoking articles A, oriented mirror symmetrically, to a single row of smoking articles A oriented in the same direction (where the spacing is obviously half of that of the two juxtaposed rows), as shown in Figure 9.

[0033] This invention also relates to a method for producing smoking articles A having a cavity C, comprising the steps of:

- feeding a full filter rod S having a multiple length (Figure 2), and
- transversally cutting the full filter rod S having a multiple length into two units (preferably identical, Figure 3); and
- feeding two rods T comprising tobacco, axially aligned with each other and spaced in such a way that the two filter units F are arranged between them (axially aligned) (Figure 2); and
- spacing the two filter units F (that is moving them axially away from each other) in such a way that an empty space V is defined between them and each contacts a rod T comprising tobacco (Figure 4, Figure5); and then:
- feeding a wrap I (Figure 6);
- wrapping the wrap I for covering: completely the two filter units F and the empty space V between the two units, and partially the two rods T comprising tobacco to connect them to the filter units F (Figure 7);
- transversally cutting the wrap I at the empty space V between the two filter units F, in such a way as to define a cavity C for each filter unit F wrapped by the wrap I and adjacent to the filter unit F (Figure 8).

[0034] Figure 9, in particular, shows smoking articles A (cigarettes) which, after being cut, have been "tip-turned" so that both are oriented in the same direction, as described above.

[0035] Preferably, the step of spacing the two filter units F comprises the sub-step of moving the two filter units F axially away from each other in such a way that an empty space V equal to the sum of the cavities C to be obtained is defined between them (that is, equal to the sum of the cavities C adjacent to each filter unit F).

[0036] Preferably, the step of feeding a wrap I comprises the sub-step of feeding a wrap I with a gram weight of between 45 and 100 g/m^2. Advantageously, this forms smoking articles A where the wrap I is located at the end that is intended to come into contact with the mouth of a user (smoker) and where the thickness of the wrap I is greater than that in prior art solutions (usually between 30 and 40 g/m^2). That way, the wrap I is not damaged

despite coming into contact with the user's mouth.

[0037] This invention also relates to a smoking article A obtained with a method as described above (see Figure 9, where 2 are shown). More specifically, the article comprises: a rod T comprising tobacco T; a filter unit F, axially in contact with the rod T comprising tobacco, and a wrap I that wraps partially the rod T comprising tobacco and completely the filter unit F, in such a way as to protrude from the filter unit F to define a cavity C.

[0038] Preferably, the wrap I has a gram weight of between 45 and 100 g/m^2. The invention also relates to a method for modifying an existing machine 1 (what is known as a filter tip attachment) for making smoking articles A having a cavity C, where the existing machine comprises:

- a picking drum 2 having at least one seat for conveying a full filter rod S of multiple length;
- a combining drum 4 that: receives in a seat of it two rods T comprising tobacco axially aligned and spaced from each other; and receives in its seat the filter rod S having a multiple length between the two rods T comprising tobacco;
- a wrapping unit 6 for completely wrapping with a wrap I the filter rod S having a multiple length and partially wrapping the two rods T comprising tobacco (for connecting them to the rod S);
- cutting means for cutting the wrap I at the wrapped filter rod S to define two distinct smoking articles A;
- end separation means for axially separating the two smoking articles A from each other.

[0039] The modifying method according to the invention comprises the following steps:

- arranging a first cutting assembly 3 upstream of the combining drum 4 for cutting the filter rod S into two filter units F;
- providing separation means 5 downstream of the first cutting assembly 3 for separating the filter units F in such a way that each contacts a rod T comprising tobacco and an empty space V is defined between the two filter units F;
- deactivating/removing the end separation means.

[0040] The method described above allows modifying an existing machine 1 (what is known as a filter tip attachment) with a few simple and inexpensive modifications to make it suitable for making smoking articles A having a cavity C.

[0041] Obviously, the invention also comprises the reverse method to return the machine 1 to the initial conditions, comprising the following steps:

- removing the first cutting assembly 3;
- removing/deactivating the first separation means 5;
- reactivating/arranging the end separation means.

[0042] The invention further relates to a kit 3, 5 for modifying an existing machine for producing smoking articles A having a cavity C, wherein the existing machine comprises:

- a picking drum 2 having at least one seat for conveying a full filter rod S of multiple length;
- a combining drum 4 that: receives in a seat of it two rods T comprising tobacco axially aligned and spaced from each other; and receives in its seat the filter rod S having a multiple length between the two rods T comprising tobacco;
- a wrapping unit 6 for completely wrapping with a wrap I the filter rod S having a multiple length and partially wrapping the two rods T comprising tobacco for connecting them to the filter units F;
- cutting means for cutting the wrap I at the wrapped filter rod S to define two distinct smoking articles A;
- end separation means for axially separating the two smoking articles A from each other.

[0043] The kit 3, 5 comprises:

- a first cutting assembly 3 disposable upstream of the combining drum 4;
- separation means 5 disposable downstream of the first cutting assembly 3.

[0044] The kit 3, 5 according to the invention allows modifying an existing machine 1 (what is known as a filter tip attachment) with a few simple and inexpensive modifications to make it suitable for making smoking articles A having a cavity C.

Claims

1. A machine (1) for producing smoking articles (A) having a cavity (C), comprising:

- a picking drum (2) having at least one seat for conveying a full filter rod (S) having a multiple length;
- a first cutting assembly (3) for cutting the full filter rod (S) having a multiple length into two filter units (F);
- a combining drum (4) that: receives in a seat of it two rods (T) comprising tobacco (T) axially aligned and spaced from each other; receives in its seat the two filter units (F) between the two rods (T) comprising tobacco;
- separation means (5), arranged downstream of the first cutting group (3), for separating the filter units (F) from each other in such a way that each one contacts a rod (T) comprising tobacco and in such a way that an empty space (V) is formed between the two filter units (F);
- a wrapping unit (6) for completely wrapping

with a wrap (I) the two filter units (F) and the empty space (V) between the filter units (F) and partially wrapping the two rods (T) comprising tobacco for connecting them to the filter units (F);
- a second cutting assembly (7) for transversally cutting the wrapped wrap (I) at said empty space (V) in such a way as to define a cavity (C) for each filter unit (F) wrapped by the wrap (I) and adjacent to the filter unit (F).

2. The machine (1) of the preceding claim wherein the separation means (5) comprise pneumatic means.

3. The machine (1) of claim 1 or 2, wherein the separation means (5) comprise at least two suction supports (50), arranged at the seat and configured for axially moving each filter unit (F) in such a way that the empty space (V) is arranged between the two filter units (F).

4. The machine (1) of claim 1 or 2, wherein the separation means (5) comprise at least two motorized rollers, arranged externally to the combining drum (4), each being able to axially move a filter unit (F) in such a way that the empty space (V) is arranged between the two filter units (F).

5. A method for producing smoking articles (A) having a cavity (C), comprising the steps of:

- feeding a full filter rod (S) having a multiple length; transversally cutting the full filter rod (S) having a multiple length into two filter units (F); and
- feeding two rods (T) comprising tobacco, axially aligned with each other and spaced in such a way that the two filter units (F) are arranged between them; and
- spacing the two filter units (F) in such a way that an empty space (V) is defined between them and that each contacts a rod (T) comprising tobacco; and then:
- feeding a wrap (I);
- wrapping the wrap (I) for covering: completely the two filter units (F) and the empty space (V) between the filter units (F), and partially the two rods (T) comprising tobacco for connecting them to the filter units (F);
- transversally cutting the wrap (I) at the empty space (V) between the two filter units (F), in such a way as to define a cavity (C) for each filter unit (F) wrapped by the wrap (I) and adjacent to the filter unit (F).

6. The method of the preceding claim, wherein the step of spacing the two filter units (F) comprises the sub-step of moving the two filter units (F) axially away from each other in such a way that an empty space (V) equal to the sum of the cavities (C) to be obtained is defined between them.

7. The method of claim 5 or 6, wherein the step of feeding a wrap (I) comprises the sub-step of feeding a wrap (I) with a weight between 45 and 100 g/m^2.

8. A smoking article (A) produced with the method of any of the claims from 5 to 8, comprising a rod (T) comprising tobacco; a filter unit (F) axially contacting the rod (T) comprising tobacco; and a wrap (I) that wraps partially the rod (T) comprising tobacco and completely the filter unit (F), in such a way as to protrude from the filter unit (F) to define a cavity (C).

9. A method for modifying an existing machine for producing smoking articles (A) having a cavity (C), wherein the existing machine comprises:

- a picking drum (2) having at least one seat for conveying a full filter rod (S) having a multiple length;
- a combining drum (4) that: receives in a seat of it two rods (T) comprising tobacco (T) axially aligned and spaced from each other; and receives in its seat the filter rod (S) having a multiple length between the two rods (T) comprising tobacco;
- a wrapping unit (6) for completely wrapping with a wrap (I) the filter rod (S) having a multiple length and partially wrapping the two rods (T) comprising tobacco for connecting them to the filter units (F);
- cutting means for cutting the wrap (I) at the wrapped filter rod (S) to define two distinct smoking articles (A);
- end separation means for axially separating the two smoking articles (A);

the method comprises the steps of:

- arranging a first cutting assembly (3) upstream of the combining drum (4) for cutting the filter rod (S) into two filter units (F);
- providing separation means (5) downstream of the first cutting assembly (3) for separating the filter units (F) in such a way that each contacts a rod (T) comprising tobacco and an empty space (V) is defined between the two filter units (F);
- deactivating/removing the end separation means.

10. A kit (3, 5) for modifying an existing machine for producing smoking articles (A) having a cavity (C), wherein the existing machine comprises:

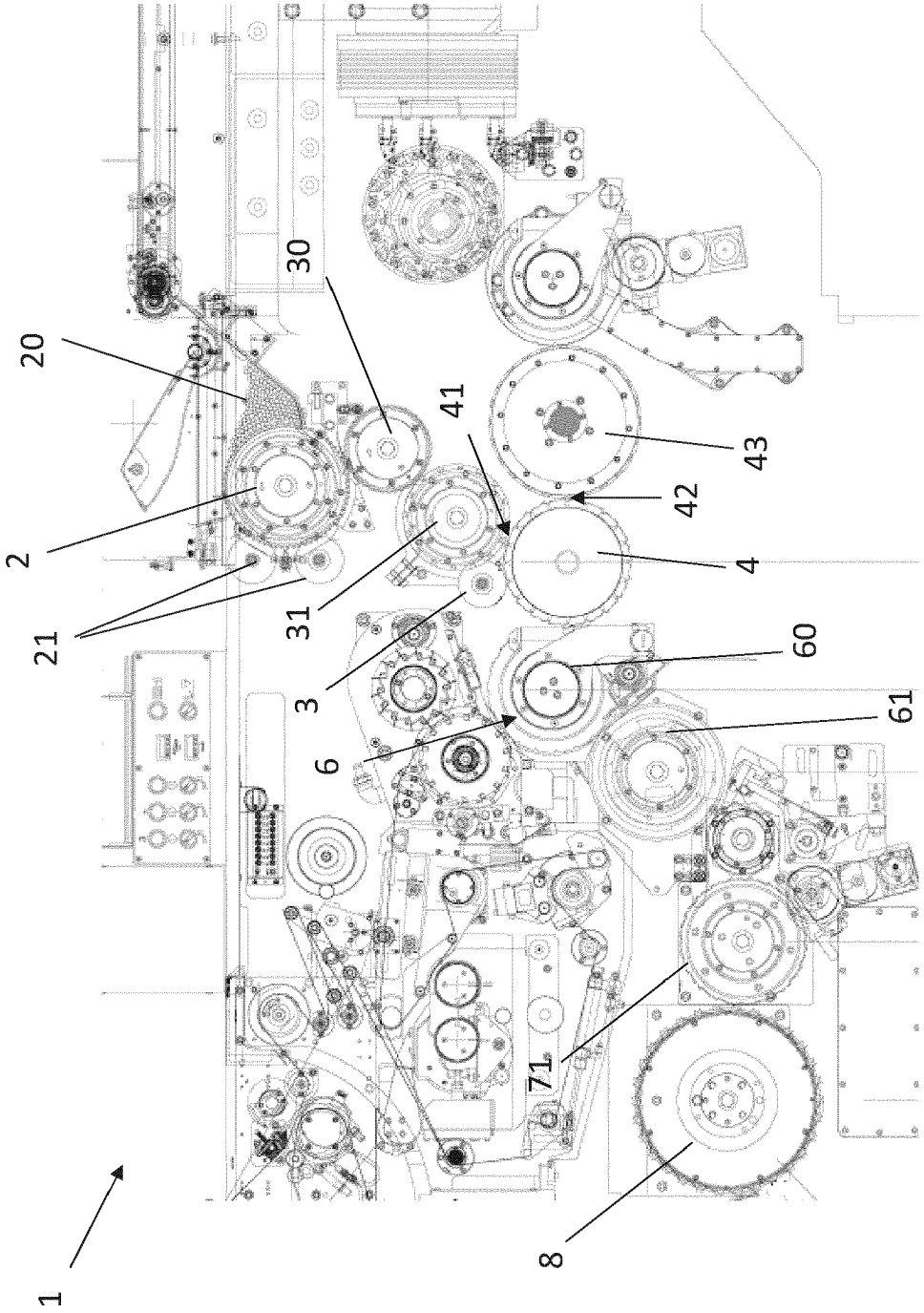
- a picking drum (2) having at least one seat for

conveying a full filter rod (S) having a multiple length;
- a combining drum (4) that: receives in a seat of it two rods (T) comprising tobacco (T) axially aligned and spaced from each other; and receives in its seat the filter rod (S) having a multiple length between the two rods (T) comprising tobacco;
- a wrapping unit (6) for completely wrapping with a wrap (I) the filter rod (S) having a multiple length and partially wrapping the two rods (T) comprising tobacco for connecting them to the filter units (F);
- cutting means for cutting the wrap (I) at the wrapped filter rod (S) to define two distinct smoking articles (A);
- end separation means (5) for axially separating the two smoking articles (A);

the kit (3, 5) comprises:

- a first cutting assembly (3) disposable upstream of the combining drum (4);
- separation means (5) disposable downstream of the first cutting assembly (3).

FIG.1



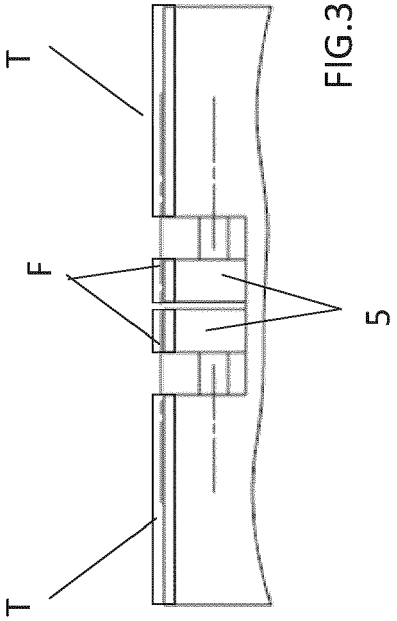


FIG.3

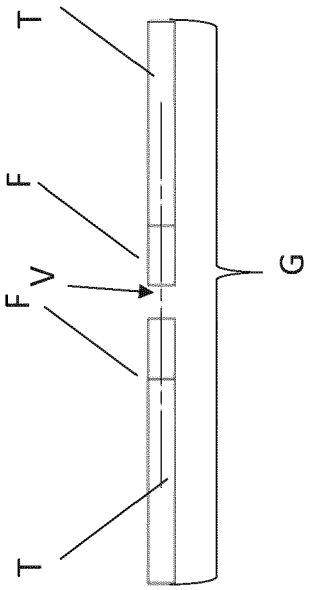


FIG.5

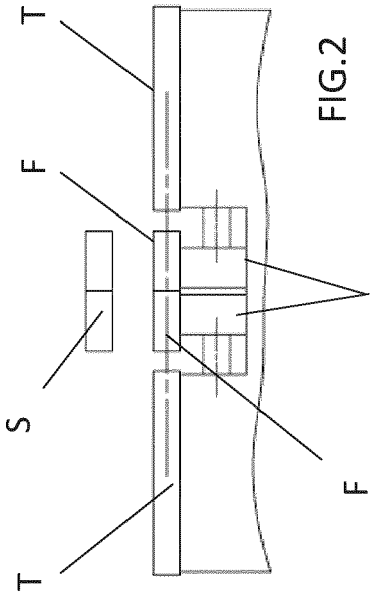


FIG.2

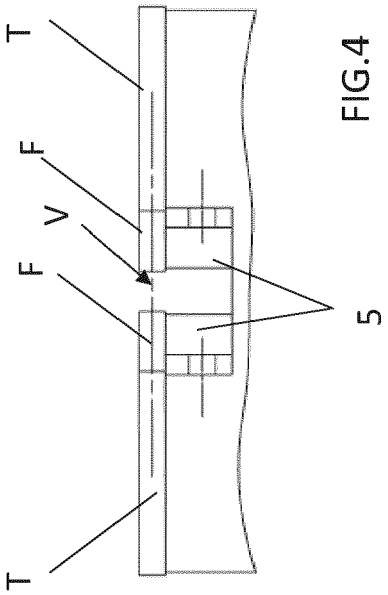


FIG.4

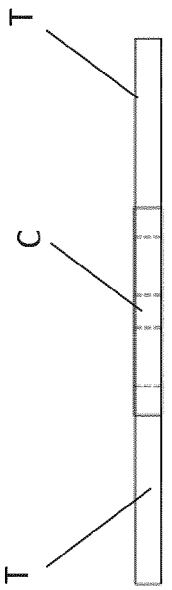


FIG.7

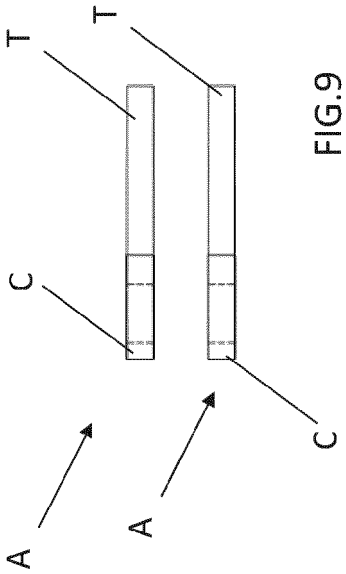


FIG.9

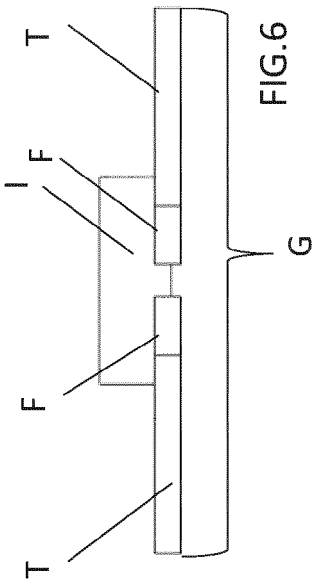


FIG.6

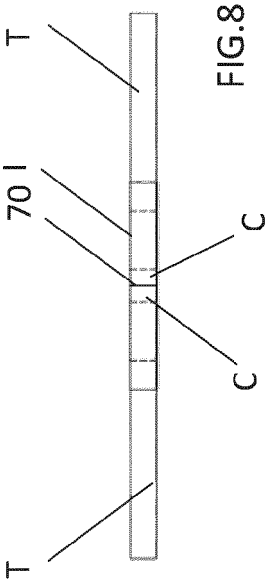


FIG.8

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EUROPEAN SEARCH REPORT

Application Number
EP 22 18 0457

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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
Munich	31 October 2022	Marzano Monterosso

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 22 18 0457

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EPO FORM P0459

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