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(54) UNIT AND METHOD FOR SEPARATING PLUGWRAPS AND APPLYING THEM TO ROD-SHAPED SMOKING ARTICLES

EINHEIT UND VERFAHREN ZUM TRENNEN VON MUNDSTÜCKPAPIEREN UND ANWENDUNG DAVON AUF STABFÖRMIGEN RAUCHARTIKELN

UNITÉ ET PROCÉDÉ POUR SÉPARER DES PAPIERS DE GAINAGE ET LES APPLIQUER SUR DES ARTICLES À FUMER EN FORME DE TIGE

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Description

Technical field

[0001] This invention relates to a unit and a method for separating plugwraps and applying them to rod-shaped smoking articles.

[0002] The unit forming the object of this invention is applicable in particular in machines known as "filter tip attachment" machines used in the tobacco industry to make traditional filter cigarettes, that is, cigarettes which can be smoked by burning the end of the cigarette opposite the filter, or cigarettes of other kinds, such as, for example, electronic cigarettes which can be smoked by electronically heating the end of the cigarette opposite the filter.

[0003] Whatever the case, the term "cigarette" is used to generally denote a plurality of products or smoking articles such as, for example, cigarettes, cigars, cigarillos and the like, provided with a filter.

Background art

[0004] Generally speaking, a "filter tip attachment" machine receives a succession of equispaced cigarette segments from a cutting station located downstream of a forming beam of a machine which makes the cigarettes, known simply as "maker". After being cut into two segments of desired length, the cigarette segments are fed to a withdrawal conveyor by way of a plurality of rotary transfer conveyors, known as conveyor drums. After withdrawing the two cigarette segments, the withdrawal conveyor spaces them axially apart to make room for a double filter. The group thus made up of two cigarette segments and a double filter is joined by a gummed plugwrap fed to the group by another drum and rolled around the group by a rolling device. Next, the group made up of cigarette segments, double filter and plugwrap is cut in half and fed to an outfeed conveyor drum.

[0005] Typically, the gummed plugwraps are made by feeding a paper web which is unwound from a roll and which, after being gummed, is cut into individual plugwraps transversely to its longitudinal direction of extension. Cutting may be performed by known means, such as, for example, a scissor cutter, an impact cutter or a sliding cutter, to divide the web into a sequence of plugwraps. Each plugwrap typically has the shape of a rectangular patch which is wrapped round the double filter and at least a short stretch of each of the cigarette segments abutting against the double filter at either end. The Applicant has identified the need to make filter cigarettes provided with outer plugwraps which are at least partly removable. Cigarettes of this kind are known from WO2016/156209 and preferably comprise a tear tab allowing the consumer to grip and partly remove the plugwrap. Other examples of known solutions in this field can be found in documents WO2017/013105, GB2246092, EP3045055 and WO2014/064433. Thus, advertise-

ments and/or graphical effects for different marketing purposes can be applied on the removable portion of the plugwrap or the zone of the filter uncovered. Furthermore, use of an at least partly removable plugwrap means that a flavourant or essence can be associated with the plugwrap to come into contact with the consumer's lips or be perceived by smell before, during or after smoking. Thus, removing the plugwrap at least partly from the filter activates a new olfactory and taste experience for the consumer who may decide its intensity and the time when to enjoy it. For example, removing a small piece of plugwrap exposes to the air a specific part of the filter which has been previously treated with a coat of flavourant and which can come into contact with the consumer. The Applicant has found that in order to separate the plugwraps from each other in such a way that after being rolled round the group they define a convenient tab-like grip profile which enables the consumer to grip it and partly remove the plugwrap, it is necessary to make at least one shaped score line.

[0006] The Applicant has then found that by using units of known kind, the step of separating the plugwrap and making the shaped stretch would be excessively complex and/or slow relative to the high production speeds required. Moreover, the step of separating the plugwrap and making the shaped stretch would subject the cutting means to excessive strain, thus reducing their working life.

Disclosure of the invention

[0007] This invention therefore has for an aim to provide a unit for separating plugwraps and applying them to rod-shaped smoking articles which allows making plugwraps with a removable portion in an efficient and reliable manner.

[0008] Another aim of this invention therefore is to provide a method for separating plugwraps and applying them to rod-shaped smoking articles which is practical and effective and which allows improving the efficiency of the production process.

[0009] The technical purpose indicated and the aims specified are substantially achieved by a unit and a method for separating plugwraps and applying them to rod-shaped smoking articles, comprising the technical features described in one or more of the appended claims.

[0010] The dependent claims, which are incorporated herein by reference, correspond to different embodiments of the invention.

Brief description of the drawings

[0011] Further features and advantages of the present invention are more apparent in the non-limiting description which follows of a preferred but non-exclusive embodiment of a unit for separating plugwraps and applying them to rod-shaped smoking articles, as illustrated in the accompanying drawings, in which:

- Figure 1 is a schematic cross section of a portion of a filter tip attachment machine comprising a first embodiment of a unit according to this invention, for separating plugwraps and applying them to rod-shaped smoking articles;
- Figure 2 is a detail view of the unit for separating plugwraps and applying them to rod-shaped smoking articles of Figure 1;
- Figure 3 is a schematic cross section of a second embodiment of a unit according to this invention, for separating plugwraps and applying them to rod-shaped smoking articles;
- Figure 4 is a schematic cross section of a third embodiment of a unit according to this invention; for separating plugwraps and applying them to rod-shaped smoking articles;
- Figures 5A and 5B are two schematic representations of possible embodiments of plugwraps obtained by this invention; and
- Figure 6 schematically illustrates rod-shaped smoking articles according to this invention during the steps of applying and rolling the plugwraps and cutting the rod-shaped smoking articles provided with the plugwraps.

Detailed description of preferred embodiments of the invention

[0012] With reference to Figure 1, the numeral 100 denotes in its entirety a portion of a filter tip attachment machine, hereinafter referred to simply as machine 100.

[0013] The machine 100 comprises a unit for separating plugwraps and applying them to rod-shaped smoking articles, denoted in its entirety by the numeral 1 and hereinafter referred to simply as unit 1.

[0014] The unit 1 is configured to separate plugwraps 2 from a web 3, preferably of paper, as will become clearer as this description continues, and apply them to rod-shaped smoking articles 101.

[0015] In the rest of this description reference is made to smoking articles 101 of the kind illustrated in Figure 6, that is to say, comprising a double filter 102 interposed between two cigarette segments 103 abutting axially against it end to end. The invention is, however, also applicable to smoking articles 101 comprising a single filter abutting axially against one cigarette segment 103.

[0016] With reference to Figure 1, the unit 1 comprises a suction roller 4, adapted to rotate about its axis of rotation 4a in the direction indicated by the arrow F4, and feed means, not illustrated in the accompanying drawings, configured to feed the web 3 on the suction roller 4 along a feed path indicated by the arrow P.

[0017] The unit 1 is configured to separate a sequence of plugwraps 2 from the web 3 by cyclically generating a transverse cutting line T on the web 3, preferably perpendicular, as illustrated in Figures 5A and 5B.

[0018] The suction roller 4 is adapted to retain the web 3 and the sequence of plugwraps 2 by suction on its own

external surface of rotation 4' while the suction roller 4 rotates.

[0019] The unit 1 also comprises transfer means 6 configured to transfer a succession of smoking articles 101 towards a suction roller 4 so that each plugwrap 2 is applied tangentially in known manner to a respective smoking article 101 at an applicator station 5.

[0020] Preferably, the transfer means 6 comprise a conveyor roller 7 provided with peripheral suction flutes capable of retaining the smoking articles 101 and adapted to rotate about its axis of rotation 7a in the direction indicated by the arrow F7.

[0021] The peripheral speed of the suction roller 4 is preferably greater than the speed of the web 3 advancing along the feed path so that the plugwraps 2 cut off are spaced at a constant spacing.

[0022] Preferably, the spacing of the plugwraps 2 coincides with the spacing of the smoking articles 101 feeding into the conveyor drum 7, so that each plugwrap 2 is applied correctly to the respective smoking article 101. Preferably, the suction roller 4 holds the plugwraps 2 by the un gummed side so that as each plugwrap 2 reaches a respective smoking article 101, that plugwrap is applied in "flag-like manner" to the smoking article 101.

[0023] The expression "flag-like manner" means that the plugwrap 2 adheres to the smoking article 101 only by a reduced portion of it; specifically, at the front edge of it. The rest of the plugwrap 2 remains lifted by known means not illustrated, which prevent the plugwrap 2 from drooping and sticking to the outer cylindrical surface of the conveyor roller 7.

[0024] The machine 100 comprises a rolling drum 8, disposed substantially tangent to the conveyor roller 7 and adapted to rotate about its axis of rotation 8a in the direction indicated by the arrow F8 and configured to receive the succession of smoking articles 101 with plugwraps 2 from the conveyor roller 7 downstream of the applicator station 5, and a rolling device 9 configured to wrap the plugwraps 2 round the smoking articles 101 provided with plugwraps 2 transported by the rolling drum 8.

[0025] In other words, after applying the plugwrap 2, the smoking articles 101 housed in the peripheral suction flutes of the conveyor drum 7 are transferred to the rolling drum 8 which moves them in the rolling device 9 in such a way as to roll the plugwraps 2 according to known methods. Preferably, the smoking articles 101 are rolled in the plugwraps 2 inside a rolling channel 9a while advancing along a longitudinal direction of travel of the channel 9a itself.

[0026] Feeding out of the rolling channel 9a are double cigarettes 104 made by the machine 100, that is, two cigarette segments 103 with a double filter 102 interposed between them and joined to each other by a plugwrap 2 wrapped round the double filter 102 and at least the end portions of the cigarette segments 103.

[0027] Preferably, after leaving the rolling channel 9a, the double cigarettes 104 are first cut into single ciga-

rettes 105 by cutting means of known type, not illustrated, and then subjected to further processing and operations of known type performed in cigarette making machines and not described here since they are outside the scope of this invention.

[0028] Advantageously, the unit 1 comprises first scoring means 10 configured to make cyclically and transversely on the web 3 or on the plugwrap 2 at least a first, preferably straight score line 11 defining at least one end segment T1 of the cutting line T and second scoring means 12 configured to make cyclically and transversely on the web 3 or on the plugwrap 2 at least a second, preferably shaped score line 13.

[0029] In the embodiment described and illustrated here, it is possible to make cyclically and transversely on the web 3 or on the plugwraps 2 at least one straight score line 11 defining at least one end segment T1 of the cutting line T and at least one shaped score line 13.

[0030] For convenience of description, the plugwraps 2 referred to hereinafter have only one straight score line 11 and only one shaped score line 13, as illustrated in the two embodiments of Figures 5A-5B.

[0031] With reference to figures 5A-5B, preferably the second scoring means 12 are configured to make the shaped score line 13 at a central portion X of the web 3 or of the plugwraps 2, while the first scoring means 10 are configured to make the straight score line 11 at opposite end portions Y of the web 3) or of the plugwraps 2, so that the straight score line 11 at least defines opposite end segments T1 of the cutting line T.

[0032] In effect, in a first embodiment of the plugwraps 2 obtained using the unit 1 of this invention, illustrated in Figure 5B, the step of making the shaped score line 13 and the step of making the straight score line 11 can preferably be performed at two longitudinally distinct positions along the feed path so that the shaped score line 13 and the straight score line 11 are made to form a single cutting line T.

[0033] It is thus possible to obtain plugwraps 2 having shaped score lines T comprising straight end segments T1 at the opposite end portions Y and a shaped central profile T2 made by the shaped score line 13 at the central portion X.

[0034] Advantageously, therefore, the first scoring means 10 and the second scoring means 12 may be disposed and adapted to be driven in such a way that the shaped score line 13 belongs to the cutting line T. Otherwise, in a second embodiment of the plugwraps 2 obtained using the unit 1 of this invention, illustrated in Figure 5A, the straight score line 11 may define the entire cutting line T the step of making the shaped score line 13 is performed on the web 3 or on the plugwraps 2 at a position along the feed path longitudinally distinct from a position corresponding to the cutting line T.

[0035] It is thus possible to obtain rectangular or square plugwraps 2 having straight score lines T comprising straight end segments T1 and a straight central profile T3 made by the straight score line 11, while the

shaped score line 13 is made at a central position of the central portion X of the web or of the plugwrap 2.

[0036] Advantageously, therefore, the first scoring means 10 and the second scoring means 12 may be disposed and adapted to be driven in such a way that the shaped score line 13 does not belong to the cutting line T. Preferably, the second scoring means 12 are configured to make at least one convex portion of the shaped score line 13 suitable for defining a grip tab L of the plugwrap 2.

[0037] Advantageously, once the plugwrap 2 has been rolled on the smoking articles 101 and the double cigarettes 104 have been divided into single cigarettes 105, the tab L can be easily gripped by the consumer to at least partly remove a portion of the plugwrap 2 corresponding to the respective part of the central portion X.

[0038] In effect, in the embodiments illustrated in the accompanying drawings, the central portion X is not gummed, allowing it to be removed by the consumer if necessary, while the opposite end portions Y are at least partly gummed to allow the plugwrap to be fixed to the double filter 102 and to the cigarette segments 103. Generally speaking, at the shaped score line 13, the web 3 is suitable for making a removable portion of the plugwrap 2, for example without the aforesaid gumming or with gumming suitable for removal.

[0039] In one embodiment, the shaped score line 13 (as shown in Figure 6 for example) has a main direction of extension which is parallel to the cutting line "T" (and relative to which the shaped score line 13 may have undulations, protrusions, etc.). That way, the shaped score line 13 allows allow the plugwrap 2 to be partly removed along a tear direction perpendicular to the cutting line "T", that is to say, along a circumferential direction on the cigarette 105.

[0040] To facilitate partial removal of the plugwrap 2 by the consumer, the web 3 preferably has at least one sequence of holes defining at least one line of weakness 14 substantially parallel to the lateral edges 3a of the web 3. Advantageously, the line of weakness 14 divides the web 3 or the plugwraps 2 into at least one first portion, adapted to receive the straight score line 11, and at least one second portion, adapted to receive the shaped score line 13, allowing the second portion to be easily and precisely removed by the consumer.

[0041] In particular in the embodiments illustrated in the accompanying drawings, the web 3 comprises two sequences of holes defining two lines of weakness 14 delimiting the central portion X, corresponding to the aforementioned second portion, and the opposite end portions Y, corresponding to the aforementioned first portions; thus, the shaped score line 13 extends between the two lines of weakness 14.

[0042] In one possible embodiment of it, the unit 1 may comprise means (not illustrated) for perforating the web 3, configured to make on the web 3 or on the plugwraps 2 the sequences of holes which define the lines of weakness 14. Alternatively, the lines of weakness 14 are ready

made on the web 3.

[0043] With reference to the first and second embodiments of the unit 1 illustrated in Figures 2 and 3, the second scoring means 12 preferably comprise at least one punch roller 15 configured to make the shaped score line 13.

[0044] More specifically, the punch roller 15 may be disposed tangentially to the suction roller 4, as in the first embodiment illustrated in Figure 2, or disposed tangentially to a punch anvil roller 16, as in the second embodiment illustrated in Figure 3, in such a way that the web 3 is positioned between the punch roller 15 and the punch anvil roller 16.

[0045] Still more preferably, the punch roller 15 may be disposed upstream, as in the embodiments of Figures 2 and 3, or downstream of the first scoring means 10.

[0046] Preferably, the second scoring means 12 comprise a first laser scoring device 17 located upstream, as in the third embodiment of the unit 1 illustrated in Figure 4, or downstream of the first scoring means 10, and configured to make the at least one shaped score line 13.

[0047] Preferably, in a possible embodiment not illustrated in the accompanying drawings, the first scoring means 10 comprise a second laser scoring device configured to make the straight score line 11.

[0048] From the foregoing description, it is clear that the shaped score line 13 can advantageously be made before or after making the respective straight score line 11, depending on requirements.

[0049] As illustrated in the three embodiments shown in Figures 2-4, the first scoring means 10 preferably comprise a scoring roller 18 rotating about its axis of rotation 18a and having a plurality of circumferentially distributed blades 19 configured to make the straight score line 11.

[0050] Preferably, in a possible embodiment of this invention, not illustrated in the accompanying drawings, the plurality of blades 19 is configured like a plurality of blade pairs so that the end segments T1 are made simultaneously.

[0051] Still more preferably, in a possible embodiment of this invention, not illustrated in the accompanying drawings, the plurality of blades 19 is configured like a plurality of blade pairs and the second scoring means 12 comprise a plurality of punches, each punch being interposed between the blades of a respective blade pair so as to make the at least one shaped score line 13 in such a way that the shaped score line defines a central profile T2 of the cutting line T interposed between and consecutive upon the opposite end segments T1 defined by the straight score line 11. Preferably, in this case, the central shaped profile T2 may be obtained, for example, using shaped blades. This solution, however, is characterized by very high costs and a very high risk of breaking the blades which would require continual maintenance operations.

[0052] The use of a blade pair with an interposed punch, on the other hand, advantageously allows making a scissor-like cut which simultaneously makes the oppo-

site end segments T1 from the outside of the web 3 according to customary scissor cutting methods and, after simultaneously making the segments T1, allows making the central shaped profile T2 by means of a punch. This avoids the damage to the blade that would occur if the cut were made starting from a single lateral edge 3a in the end portions Y, then interrupted at the central portion X corresponding to the shaped score line 13 and resumed after the central portion X to make the opposite end portion Y. In effect, at this point, the blade would have to resume the scissor cut which, since it is made by crossing the edges and bending the top blade, would lead to splintering of the blade, which would thus be unable to have starting guide edges because the cut must be complete and blended into the one made by the punch.

[0053] This invention achieves the preset aims by overcoming the above mentioned disadvantages of the prior art and providing the user with a unit for separating plugwraps and applying them to rod-shaped smoking articles and which allows efficiently making a smoking article provided with a plugwrap having a portion which can be easily removed by a consumer and allowing the removable portion to be used to meet a diversity of production requirements.

[0054] This invention also provides the user with a method for separating plugwraps and applying them to rod-shaped smoking articles and which guarantees maximum flexibility and operating and production versatility, allowing each plugwrap to be made with one or more shaped score lines at a cutting line or at a central portion thereof.

[0055] Moreover, the filter tip attachment machine comprising the unit according to this invention advantageously allows improving the entire production process and the quality and variety of the rod-shaped smoking articles produced.

Claims

1. A unit (1) for separating plugwraps (2) and applying them to rod-shaped smoking articles (101), comprising:

- a suction roller (4) adapted to rotate about its own axis of rotation (4a),
- feeding means configured to feed a web (3), preferably of paper, on the suction roller (4) along a feed path,

wherein the unit (1) is configured to separate from the web (3) a sequence of plugwraps (2) by cyclically generating a transverse cutting line (T) on the web (3), and wherein the suction roller (4) is adapted to retain the web (3) and the sequence of plugwraps (2) by suction on its own external surface of rotation (4') while the suction roller (4) rotates,

- transfer means (6) configured to transfer a succession of smoking articles (101) towards the suction roller (4) so that each plugwrap (2) is applied to a respective smoking article (101) at an applicator station (5);
- first scoring means (10) configured to make cyclically and transversely on the web (3) or on the plugwrap (2) at least a first, straight score line (11) defining at least one end segment (T1) of the cutting line (T);

characterized in that it comprises second scoring means (12) configured to make cyclically and transversely on the web (3) or on the plugwrap (2) at least a second, shaped score line (13); said shaped score line (13) having a main direction of extension parallel to the cutting line (T) and configured to allow the plugwrap (2) to be partly removed along a tear direction perpendicular to said cutting line (T), namely along a circumferential direction on the rod-shaped smoking article (101).

2. The unit (1) according to claim 1, wherein the second scoring means (12) are configured to make at least one shaped score line (13) at a central portion (X) of the web (3) or of the plugwraps (2), and wherein the first scoring means (10) are configured to make at least one straight score line (11) at opposite end portions (Y) of the web (3) or of the plugwraps (2), the at least one straight score line (11) at least defining opposite end segments (T1) of the cutting line (T).
3. The unit (1) according to one or more of the preceding claims, wherein the second scoring means (12) comprise a first laser scoring device (17) located upstream or downstream of the first scoring means (10) and configured to make the at least one shaped score line (13).
4. The unit (1) according to one or more of the preceding claims, wherein the second scoring means (12) comprise at least one punch roller (15) configured to make the at least one shaped score line (13), the at least one punch roller (15) being disposed tangentially to the suction roller (4) or disposed tangentially to a punch anvil roller (16), the web (3) being positioned between the punch roller (15) and the punch anvil roller (16).
5. The unit (1) according to claim 4, wherein the at least one punch roller (15) is disposed upstream or downstream of the first scoring means (10).
6. The unit (1) according to one or more of the preceding claims, wherein the first scoring means (10) comprise a second laser scoring device configured to make the at least one straight score line (11).
7. The unit (1) according to one or more of the preceding claims, wherein the web (3) has at least one sequence of holes defining at least one line of weakness (14) substantially parallel to lateral edges (3a) of the web (3), the at least one line of weakness (14) dividing the web (3) or the plugwraps (2) into at least one first portion, adapted to receive the at least one straight score line (11), and at least one second portion, adapted to receive the at least one shaped score line (13).
8. The unit (1) according to claim 7, when dependent on claim 2, comprising two sequences of holes defining two lines of weakness (14) delimiting the central portion (X) and the opposite end portions (Y), respectively, the second scoring means (12) being configured to make the at least one shaped score line (13) which extends between the two lines of weakness (14).
9. The unit (1) according to claim 7 or 8, comprising means for perforating the web (3), configured to make on the web (3) or on the plugwraps (2) the at least one sequence of holes.
10. The unit (1) according to one or more of the preceding claims, wherein the second scoring means (12) are configured to make at least one convex portion of the at least one shaped score line (13) suitable for defining a grip tab (L) of the plugwrap (2) and/or to make undulations or protrusions relative to said main direction of extension of the second score line (13).
11. The unit (1) according to one or more of the preceding claims, wherein the first scoring means (10) comprise a scoring roller (18) rotating about its own axis of rotation (18a) and having a plurality of circumferentially distributed blades (19) configured to make the at least one straight score line (11).
12. The unit (1) according to claim 11, when dependent on claim 2, wherein the plurality of blades (19) is configured like a plurality of blade pairs and wherein the second scoring means (12) comprise a plurality of punches, each punch being interposed between the blades of a respective blade pair in such a way as to make the at least one shaped score line (13), the at least one shaped score line (13) defining a central shaped profile (T2) of the cutting line (T) interposed between and consecutive upon the opposite end segments (T1) defined by the at least one straight score line (11).
13. The unit (1) according to one or more of claims 1-10, wherein the first scoring means (10) and the second scoring means (12) are disposed and adapted to be driven in such a way that the at least one shaped

score line (13) does not belong to the cutting line (T).

14. A method for separating plugwraps (2) and applying them to rod-shaped smoking articles (101), comprising the following steps.:

- feeding a web (3), preferably of paper along a feed path,
- cyclically separating from the web (3) a sequence of plugwraps (2) by means of a cutting line (T) transverse to the web (3),
- retaining the web (3) and the sequence of plugwraps (2) by suction on an external surface of rotation (4') of a suction roller (4),
- feeding a succession of smoking articles (101) towards the suction roller (4) so that each plugwrap (2) is applied to a respective smoking article (101) at an applicator station (5),
- cyclically and transversely scoring the web (3) or the plugwraps (2) to make at least one first, straight, score line (11) defining at least one end segment (T1) of the cutting line (T);

characterized in that it comprises the following steps:

- cyclically and transversely scoring the web (3) or the plugwraps (2) to make at least one second, shaped, score line (13) having a main direction of extension parallel to the cutting line (T) and configured to allow the plugwrap (2) to be partly removed along a tear direction perpendicular to said cutting line (T) along a circumferential direction on the rod-shaped smoking article (101).

15. The method according to claim 14, wherein the step of making the at least one shaped score line (13) and the step of making the at least one straight score line (11) are performed at two longitudinally distinct positions along the feed path, the at least one shaped score line (13) and the at least one straight score line (11) being made to form a single cutting line (T).

16. The method according to claim 14, wherein the step of making the at least one shaped score line (13) and the step of making the at least one straight score line (11) are performed at the same longitudinal position along the feed path, the at least one shaped score line (13) and the at least one straight score line (11) being made to form a single cutting line (T).

17. The method according to claim 14, wherein the at least one straight score line (11) defines the cutting line (T) and the step of making the at least one shaped score line (13) is performed on the web (3) or on the plugwraps (2) at a position along the feed path longitudinally distinct from a position corre-

sponding to the cutting line (T).

18. The method according to one or more of claims 14-17 wherein the at least one shaped score line (13) is made at a central portion (X) of the web (3) or of the plugwraps (2), and wherein the at least one straight score line (11) is made at opposite end portions (Y) of the web (3) or of the plugwraps (2), the at least one straight score line (11) defining opposite end segments (T1) of the cutting line (T), the opposite end segments (T1) being made simultaneously.

19. The method according to one or more of claims 14-18 wherein the at least one second, shaped score line (13) presents undulations or protrusions relative to said main direction of extension of the second score line (13) and/or at least one convex portion of the at least one shaped score line (13) suitable for defining a grip tab (L) of the plugwrap (2).

20. A filter tip attachment machine (100), comprising:

- a unit (1) according to one or more of claims 1-13,
- a rolling drum (8) configured to receive the succession of smoking articles (101) provided with plugwraps (2) from the transfer means (6) downstream of the applicator station (5),
- a rolling device (9) configured to wrap the plugwraps (2) around the smoking articles (101) provided with plugwraps (2) and transported by the rolling drum (8).

35 Patentansprüche

1. Einheit (1) zum Trennen von Mundstückpapieren (2) und deren Anbringen an stabförmigen Rauchartikeln (101), umfassend:

- eine Saugwalze (4), die ausgelegt ist, um sich um ihre eigene Rotationsachse (4a) zu drehen,
- Zuführungsmittel, die konfiguriert sind, um eine Bahn (3), die vorzugsweise aus Papier besteht, auf der Saugwalze (4) entlang eines Zuführungswegs zuzuführen, wobei die Einheit (1) konfiguriert ist, um von der Bahn (3) eine Abfolge von Mundstückpapieren (2) zu trennen, indem zyklisch eine Querschneidlinie (T) auf der Bahn (3) erzeugt wird, und wobei die Saugwalze (4) ausgelegt ist, um die Bahn (3) und die Abfolge von Mundstückpapieren (2) durch Ansaugung auf deren äußeren Rotationsoberfläche (4') zu halten, während sich die Saugwalze (4) dreht,
- Übergabemittel (6), die konfiguriert sind, um eine Abfolge von Rauchartikeln (101) hinführend zur Saugwalze (4) zu übergeben, sodass ein jedes Mundstückpapier (2) an einem jewei-

ligen Rauchartikel (101) an einer Anbringungsstation (5) angebracht wird;
 erste Ritzmittel (10), die konfiguriert sind, um zyklisch und quer auf der Bahn (3) oder dem Mundstückpapier (2) mindestens eine erste gerade Ritzlinie (11) auszubilden, definierend mindestens ein Endsegment (T1) der Schneidlinie (T);

dadurch gekennzeichnet, dass sie zweite Ritzmittel (12) umfasst, die konfiguriert sind, um zyklisch und quer auf der Bahn (3) oder dem Mundstückpapier (2) mindestens eine zweite geformte Ritzlinie (13) auszubilden, wobei die geformte Ritzlinie (13) eine Hauptausdehnungsrichtung aufweist, die parallel zur Schneidlinie (T) angeordnet ist, und konfiguriert, um zu erlauben, dass das Mundstückpapier (2) teilweise entlang einer Reißlinie, die senkrecht zur Schneidlinie (T) verläuft, nämlich entlang einer Umfangsrichtung auf dem stabförmigen Rauchartikel (101), entfernt wird.

2. Einheit (1) nach Anspruch 1, wobei die zweiten Ritzmittel (12) konfiguriert sind, um mindestens eine geformte Ritzlinie (13) an einem mittigen Abschnitt (X) der Bahn (3) oder der Mundstückpapiere (2) auszubilden, und wobei die ersten Ritzmittel (10) konfiguriert sind, um mindestens eine gerade Ritzlinie (11) an gegenüberliegenden Endabschnitten (Y) der Bahn (3) oder der Mundstückpapiere (2) auszubilden, wobei die mindestens eine gerade Ritzlinie (11) mindestens gegenüberliegende Endsegmente (T1) der Schneidlinie (T) definiert.
3. Einheit (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei die zweiten Ritzmittel (12) eine erste Laserritzvorrichtung (17) umfassen, die vor oder nach den ersten Ritzmitteln (10) angeordnet und konfiguriert ist, um mindestens eine geformte Ritzlinie (13) auszubilden.
4. Einheit (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei die zweiten Ritzmittel (12) mindestens eine Stanzwalze (15) umfassen, die konfiguriert ist, um die mindestens eine geformte Ritzlinie (13) auszubilden, wobei die mindestens eine Stanzwalze (15) tangential zur Saugwalze (4) angeordnet oder tangential zu einer Stanzgegenwalze (16) angeordnet ist, wobei die Bahn (3) zwischen der Stanzwalze (15) und der Stanzgegenwalze (16) positioniert ist.
5. Einheit (1) nach Anspruch 4, wobei die mindestens eine Stanzwalze (15) vor oder nach den ersten Ritzmitteln (10) angeordnet ist.
6. Einheit (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei die ersten Ritzmittel

(10) eine zweite Laserritzvorrichtung umfassen, die konfiguriert ist, um mindestens eine gerade Ritzlinie (11) auszubilden.

7. Einheit (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei die Bahn (3) mindestens eine Abfolge von Löchern aufweist, definierend mindestens eine Sollbruchlinie (14), die im Wesentlichen parallel zu Seitenkanten (3a) der Bahn (3) angeordnet ist, wobei die mindestens eine Sollbruchlinie (14) die Bahn (3) oder Mundstückpapiere (2) in mindestens einen ersten Abschnitt, der ausgelegt ist, um die mindestens eine gerade Ritzlinie (11) aufzunehmen, und mindestens einen zweiten Abschnitt, der ausgelegt ist, um die mindestens eine geformte Ritzlinie (13) aufzunehmen, geteilt ist.
8. Einheit (1) nach Anspruch 7, wenn abhängig von Anspruch 2, umfassend zwei Abfolgen von Löchern, definierend zwei Sollbruchlinien (14), die jeweils den mittigen Abschnitt (X) und die gegenüberliegenden Endabschnitte (Y) abgrenzen, wobei die zweiten Ritzmittel (12) konfiguriert sind, um die mindestens eine geformte Ritzlinie (13) auszubilden, die sich zwischen den zwei Sollbruchlinien (14) erstreckt.
9. Einheit (1) nach Anspruch 7 oder 8, umfassend Mittel zum Perforieren der Bahn (3), die konfiguriert sind, um auf der Bahn (3) oder den Mundstückpapieren (2) mindestens eine Abfolge von Löchern auszubilden.
10. Einheit (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei die zweiten Ritzmittel (12) konfiguriert sind, um mindestens einen konvexen Abschnitt der mindestens einen geformten Ritzlinie (13) auszubilden, geeignet, um eine Greifflasche (L) des Mundstückpapiers (2) zu definieren und/oder um Wellungen oder Vorsprünge relativ zur genannten Hauptausdehnungsrichtung der zweiten Ritzlinie (13) auszubilden.
11. Einheit (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei die ersten Ritzmittel (10) eine Ritzwalze (18) umfassen, die sich um ihre eigene Rotationsachse (18a) dreht und eine Vielzahl von umfangsseitig verteilten Schneidmessern (19) aufweist, konfiguriert, um die mindestens eine gerade Ritzlinie (11) auszubilden.
12. Einheit (1) nach Anspruch 11, wenn abhängig von Anspruch 2, wobei die Vielzahl von Schneidmessern (19) wie eine Vielzahl von Schneidmesserpaaren konfiguriert ist und wobei die zweiten Ritzmittel (12) eine Vielzahl von Stanzen umfassen, wobei eine jede Stanze zwischen den Schneidmessern eines jeweiligen Schneidmesserpaars eingesetzt ist, so dass die mindestens eine geformte Ritzlinie (13)

- ausgebildet wird, wobei die mindestens eine geformte Ritzlinie (13) ein mittiges geformtes Profil (T2) der Schneidlinie (T) definiert, eingesetzt zwischen den gegenüberliegenden Endsegmenten (T1), definiert durch die mindestens eine gerade Ritzlinie (11), und auf diese folgend.
13. Einheit (1) nach einem oder mehreren der Ansprüche 1 bis 10, wobei die ersten Ritzmittel (10) und die zweiten Ritzmittel (12) angeordnet und ausgelegt sind, um so angetrieben zu werden, dass die mindestens eine geformte Ritzlinie (13) nicht zur Schneidlinie (T) gehört.
14. Verfahren zum Trennen von Mundstückpapieren (2) und deren Anbringen an stabförmigen Rauchartikeln (101), umfassend die folgenden Schritte:
- Zuführen einer Bahn (3), vorzugsweise aus Papier, entlang eines Zuführungswegs,
 - zyklisches Trennen einer Abfolge von Mundstückpapieren (2) aus der Bahn (3) mittels einer Schneidlinie (T), die quer zur Bahn (3) verläuft,
 - Halten der Bahn (3) und der Abfolge von Mundstückpapieren (2) durch Ansaugen auf einer äußeren Rotationsoberfläche (4') einer Saugwalze (4),
 - Zuführen einer Abfolge von Rauchartikeln (101) hinführend zu einer Saugwalze (4), so dass ein jedes Mundstückpapier (2) an einem jeweiligen Rauchartikel (101) an einer Anbringungsstation (5) angebracht wird,
 - zyklisch und quer Ritzen der Bahn (3) oder der Mundstückpapiere (2), um mindestens eine erste gerade Ritzlinie (11) auszubilden, definierend mindestens ein Endsegment (T1) der Schneidlinie (T);
- dadurch gekennzeichnet, dass** es die folgenden Schritte umfasst:
- zyklisch und quer Ritzen der Bahn (3) oder der Mundstückpapiere (2), um mindestens eine zweite geformte Ritzlinie (13) auszubilden, aufweisend eine Hauptausdehnungsrichtung, die parallel zur Schneidlinie (T) angeordnet ist, und konfiguriert ist, um zu erlauben, dass das Mundstückpapier (2) teilweise entlang einer Reißlinie, die senkrecht zur Schneidlinie (T) entlang einer Umfangsrichtung auf dem stabförmigen Rauchartikel (101) verläuft, entfernt wird.
15. Verfahren nach Anspruch 14, wobei der Schritt zum Ausbilden der mindestens einen geformten Ritzlinie (13) und der Schritt zum Ausbilden der mindestens einen geraden Ritzlinie (11) an zwei längsseitig unterschiedlichen Positionen entlang des Zuführungswegs durchgeführt werden, wobei die mindestens eine geformte Ritzlinie (13) und die mindestens eine gerade Ritzlinie (11) ausgebildet sind, um eine einzelne Schneidlinie (T) zu formen.
16. Verfahren nach Anspruch 14, wobei der Schritt zum Ausbilden der mindestens einen geformten Ritzlinie (13) und der Schritt zum Ausbilden der mindestens einen geraden Ritzlinie (11) an derselben Längsposition entlang des Zuführungswegs durchgeführt werden, wobei die mindestens eine geformte Ritzlinie (13) und die mindestens eine gerade Ritzlinie (11) ausgebildet sind, um eine einzelne Schneidlinie (T) zu formen.
17. Verfahren nach Anspruch 14, wobei die mindestens eine gerade Ritzlinie (11) die Schneidlinie (T) definiert und der Schritt zum Ausbilden der mindestens einen geformten Ritzlinie (13) auf der Bahn (3) oder den Mundstückpapieren (2) an einer Position entlang des Zuführungswegs längsseitig unterschiedlich von einer Position, die der Schneidlinie (T) entspricht, durchgeführt wird.
18. Verfahren nach einem oder mehreren der Ansprüche 14 bis 17, wobei die mindestens eine geformte Ritzlinie (13) an einem mittigen Abschnitt (X) der Bahn (3) oder der Mundstückpapiere (2) ausgebildet ist und wobei die mindestens eine gerade Ritzlinie (11) an gegenüberliegenden Endabschnitten (Y) der Bahn (3) oder der Mundstückpapiere (2) ausgebildet ist, wobei die mindestens eine gerade Ritzlinie (11) gegenüberliegende Endsegmente (T1) der Schneidlinie (T) definiert, wobei die gegenüberliegenden Endsegmente (T1) simultan ausgebildet werden.
19. Verfahren nach einem oder mehreren der Ansprüche 14 bis 18, wobei die mindestens eine zweite geformte Ritzlinie (13) Wellungen oder Vorsprünge relativ zur genannten Hauptausdehnungsrichtung der zweiten Ritzlinie (13) und/oder mindestens einen konvexen Abschnitt der mindestens einen geformten Ritzlinie (13) aufweist, die geeignet ist, um eine Greifflasche (L) des Mundstückpapiers (2) zu definieren.
20. Filterspitzenbefestigungsmaschine (100), umfassend:
- eine Einheit (1) nach einem oder mehreren der Ansprüche 1 bis 13,
 - eine Rolltrommel (8), die konfiguriert ist, um die Abfolge von Rauchartikeln (101), versehen mit Mundstückpapieren (2), von den Übergabemitteln (6) nach der Anbringungsstation (5) zu empfangen,
 - eine Rollvorrichtung (9), die konfiguriert ist, um die Mundstückpapiere (2) rund um die Rauchartikel (101), die mit Mundstückpapieren (2) versehen sind und von der Rolltrommel (8) befördert werden, zu wickeln.

Revendications

1. Unité (1) pour séparer des papiers de gainage (2) et les appliquer sur des articles à fumer (101) en forme de tige, comprenant :

- un rouleau d'aspiration (4) adapté pour tourner autour de son propre axe de rotation (4a),
- des moyens d'alimentation configurés pour alimenter une bande (3), de préférence de papier, sur le rouleau d'aspiration (4) le long d'un parcours d'alimentation, dans laquelle l'unité (1) est configurée pour séparer de la bande (3) une séquence de papiers de gainage (2) en générant de façon cyclique une ligne de coupe transversale (T) sur la bande (3), et dans laquelle le rouleau d'aspiration (4) est adapté pour retenir la bande (3) et la séquence de papiers de gainage (2) par aspiration sur sa propre surface externe de rotation (4') pendant que le rouleau d'aspiration (4) tourne,
- des moyens de transfert (6) configurés pour transférer une succession d'articles à fumer (101) vers le rouleau d'aspiration (4) de sorte que chaque papier de gainage (2) soit appliqué sur un article à fumer (101) respectif en correspondance d'un poste d'application (5) ;
- des premiers moyens d'incision (10) configurés pour réaliser cycliquement et transversalement sur la bande (3) ou sur le papier de gainage (2) au moins une première ligne d'incision (11) rectiligne définissant au moins un segment d'extrémité (T1) de la ligne de coupe (T) ;

caractérisée en ce qu'elle comprend des seconds moyens d'incision (12) configurés pour réaliser de manière cyclique et transversale sur la bande (3) ou sur le papier de gainage (2) au moins une seconde ligne d'incision (13) façonnée ; ladite ligne d'incision (13) façonnée ayant une direction principale d'extension parallèle à la ligne de coupe (T) et étant configurée pour permettre au papier de gainage (2) d'être partiellement retiré le long d'une direction de déchirure perpendiculaire à ladite ligne de coupe (T), à savoir le long d'une direction circonférentielle sur l'article à fumer (101) en forme de tige.

2. Unité (1) selon la revendication 1, dans laquelle les seconds moyens d'incision (12) sont configurés pour réaliser au moins une ligne d'incision (13) façonnée en correspondance d'une partie centrale (X) de la bande (3) ou des papiers de gainage (2), et dans laquelle les premiers moyens d'incision (10) sont configurés pour réaliser au moins une ligne d'incision (11) rectiligne en correspondance des parties d'extrémité (Y) opposées de la bande (3) ou des papiers de gainage (2), l'au moins une ligne d'incision (11) rectiligne définissant au moins des segments d'ex-

trémité (T1) opposés de la ligne de coupe (T).

3. Unité (1) selon une ou plusieurs des revendications précédentes, dans laquelle les seconds moyens d'incision (12) comprennent un premier dispositif d'incision laser (17) situé en amont ou en aval des premiers moyens d'incision (10) et configuré pour réaliser l'au moins une ligne d'incision (13) façonnée.
4. Unité (1) selon une ou plusieurs des revendications précédentes, dans laquelle les seconds moyens d'incision (12) comprennent au moins un rouleau poinçonneur (15) configuré pour réaliser au moins une ligne d'incision (13) façonnée, l'au moins un rouleau poinçonneur (15) étant disposé tangentielle-ment au rouleau d'aspiration (4) ou disposé tangentielle-ment à un contre-rouleau poinçonneur (16), la bande (3) étant positionnée entre le rouleau poinçonneur (15) et le contre-rouleau poinçonneur (16).
5. Unité (1) selon la revendication 4, dans laquelle l'au moins un rouleau poinçonneur (15) est disposé en amont ou en aval des premiers moyens d'incision (10).
6. Unité (1) selon une ou plusieurs des revendications précédentes, dans laquelle les premiers moyens d'incision (10) comprennent un second dispositif d'incision laser configuré pour réaliser au moins une ligne d'incision (11) rectiligne.
7. Unité (1) selon une ou plusieurs des revendications précédentes, dans laquelle la bande (3) comporte au moins une séquence de trous définissant au moins une ligne de faiblesse (14) substantiellement parallèle aux bords latéraux (3a) de la bande (3), l'au moins une ligne de faiblesse (14) divisant la bande (3) ou les papiers de gainage (2) en au moins une première partie adaptée pour recevoir l'au moins une ligne d'incision (11) rectiligne, et au moins une seconde partie adaptée pour recevoir l'au moins une ligne d'incision (13) façonnée.
8. Unité (1) selon la revendication 7, lorsqu'elle dépend de la revendication 2, comprenant deux séquences de trous définissant deux lignes de faiblesse (14) délimitant, respectivement, la partie centrale (X) et les parties d'extrémité (Y) opposées, les seconds moyens d'incision (12) étant configurés pour réaliser l'au moins une ligne d'incision (13) façonnée, se prolongeant entre les deux lignes de faiblesse (14).
9. Unité (1) selon la revendication 7 ou 8, comprenant des moyens, servant à perforer la bande (3), configurés pour réaliser l'au moins une séquence de trous sur la bande (3) ou sur les papiers de gainage (2).
10. Unité (1) selon une ou plusieurs des revendications

- précédentes, dans laquelle les seconds moyens d'incision (12) sont configurés pour réaliser au moins une partie convexe de l'au moins une ligne d'incision (13) façonnée, adaptée pour définir une languette de préhension (L) du papier de gainage (2) et/ou pour réaliser des ondulations ou des saillies par rapport à ladite direction principale d'extension de la seconde ligne d'incision (13).
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11. Unité (1) selon une ou plusieurs des revendications précédentes, dans laquelle les premiers moyens d'incision (10) comprennent un rouleau d'incision (18) tournant autour de son propre axe de rotation (18a) et comportant une pluralité de lames (19), réparties sur la circonférence, configurées pour réaliser au moins une ligne d'incision (11) rectiligne.
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12. Unité (1) selon la revendication 11, lorsqu'elle dépend de la revendication 2, dans laquelle la pluralité de lames (19) est configurée comme une pluralité de paires de lames et dans laquelle les seconds moyens d'incision (12) comprennent une pluralité de poinçons, chaque poinçon étant interposé entre les lames d'une paire de lames respective de manière à réaliser l'au moins une ligne d'incision (13) façonnée, l'au moins une ligne d'incision (13) façonnée définissant un profil central (T2) façonné de la ligne de coupe (T) interposé entre et consécutif sur les segments d'extrémité (T1) opposés définis par l'au moins une ligne d'incision (11) rectiligne.
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13. Unité (1) selon une ou plusieurs des revendications 1-10, dans laquelle les premiers moyens d'incision (10) et les seconds moyens d'incision (12) sont disposés et adaptés pour être entraînés de telle manière que l'au moins une ligne d'incision (13) façonnée n'appartient pas à la ligne de coupe (T).
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14. Procédé pour séparer des papiers de gainage (2) et les appliquer sur des articles à fumer (101) en forme de tige, comprenant les étapes suivantes :
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- alimenter une bande (3), de préférence de papier, le long d'un parcours d'alimentation,
 - séparer cycliquement de la bande (3) une séquence de papiers de gainage (2) au moyen d'une ligne de coupe (T) transversale à la bande (3),
 - retenir la bande (3) et la séquence de papiers de gainage (2) par aspiration sur une surface externe de rotation (4') d'un rouleau d'aspiration (4),
 - alimenter une succession d'articles à fumer (101) vers le rouleau d'aspiration (4) de sorte que chaque papier de gainage (2) soit appliqué sur un article à fumer (101) respectif à un poste d'application (5),
 - inciser de façon cyclique et transversale la bande (3) ou les papiers de gainage (2) pour réaliser au moins une première ligne d'incision (11) rectiligne définissant au moins un segment d'extrémité (T1) de la ligne de coupe (T) ;
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- caractérisé en ce qu'il** comprend les étapes suivantes :
- inciser de façon cyclique et transversale la bande (3) ou les papiers de gainage (2) pour réaliser au moins une seconde ligne d'incision (13) façonnée ayant une direction principale d'extension parallèle à la ligne de coupe (T) et configurée pour permettre au papier de gainage (2) d'être partiellement retiré le long d'une direction de déchirure perpendiculaire à ladite ligne de coupe (T) le long d'une direction circonférentielle sur l'article à fumer (101) en forme de tige.
15. Procédé selon la revendication 14, dans lequel l'étape consistant à réaliser l'au moins une ligne d'incision (13) façonnée et l'étape consistant à réaliser l'au moins une ligne d'incision (11) rectiligne sont réalisées à deux positions longitudinalement distinctes le long du parcours d'alimentation, l'au moins une ligne d'incision (13) façonnée et l'au moins une ligne d'incision (11) rectiligne étant réalisées pour former une seule ligne de coupe (T).
16. Procédé selon la revendication 14, dans lequel l'étape consistant à réaliser l'au moins une ligne d'incision (13) façonnée et l'étape consistant à réaliser l'au moins une ligne d'incision (11) rectiligne sont réalisées à la même position longitudinale le long du parcours d'alimentation, l'au moins une ligne d'incision (13) façonnée et l'au moins une ligne d'incision (11) rectiligne étant réalisées pour former une seule ligne de coupe (T).
17. Procédé selon la revendication 14, dans lequel l'au moins une ligne d'incision (11) rectiligne définit la ligne de coupe (T) et l'étape consistant à réaliser l'au moins une ligne d'incision (13) façonnée est réalisée sur la bande (3) ou sur les papiers de gainage (2) en correspondance d'une position le long du parcours d'alimentation longitudinalement distincte d'une position correspondant à la ligne de coupe (T).
18. Procédé selon une ou plusieurs des revendications 14-17, dans lequel l'au moins une ligne d'incision (13) façonnée est réalisée en correspondance d'une partie centrale (X) de la bande (3) ou des papiers de gainage (2), et dans lequel l'au moins une ligne d'incision (11) rectiligne est réalisée sur des parties d'extrémité (Y) opposées de la bande (3) ou des papiers de gainage (2), l'au moins une ligne d'incision (11) rectiligne définissant des segments d'extrémité (T1) opposés de la ligne de coupe (T), les segments d'extrémité (T1) opposés étant réalisés simultanément.

19. Procédé selon une ou plusieurs des revendications 14-18, dans lequel l'au moins une seconde ligne d'incision (13) façonnée présente des ondulations ou des saillies par rapport à ladite direction principale d'extension de la seconde ligne d'incision (13) et/ou au moins une partie convexe de l'au moins une ligne d'incision (13) façonnée, adaptée pour définir une languette de préhension (L) du papier de gainage (2). 5
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20. Machine de fixation de bout-filtre (100), comprenant :
- une unité (1) selon l'une ou plusieurs des revendications 1-13, 15
 - un tambour roulant (8) configuré pour recevoir la succession d'articles à fumer (101) pourvus de papiers de gainage (2) provenant de moyens de transfert (6) situés en aval du poste d'application (5), 20
 - un dispositif roulant (9) configuré pour enrouler les papiers de gainage (2) autour des articles à fumer (101) pourvus de papiers de gainage (2) et transportés par le tambour roulant (8). 25

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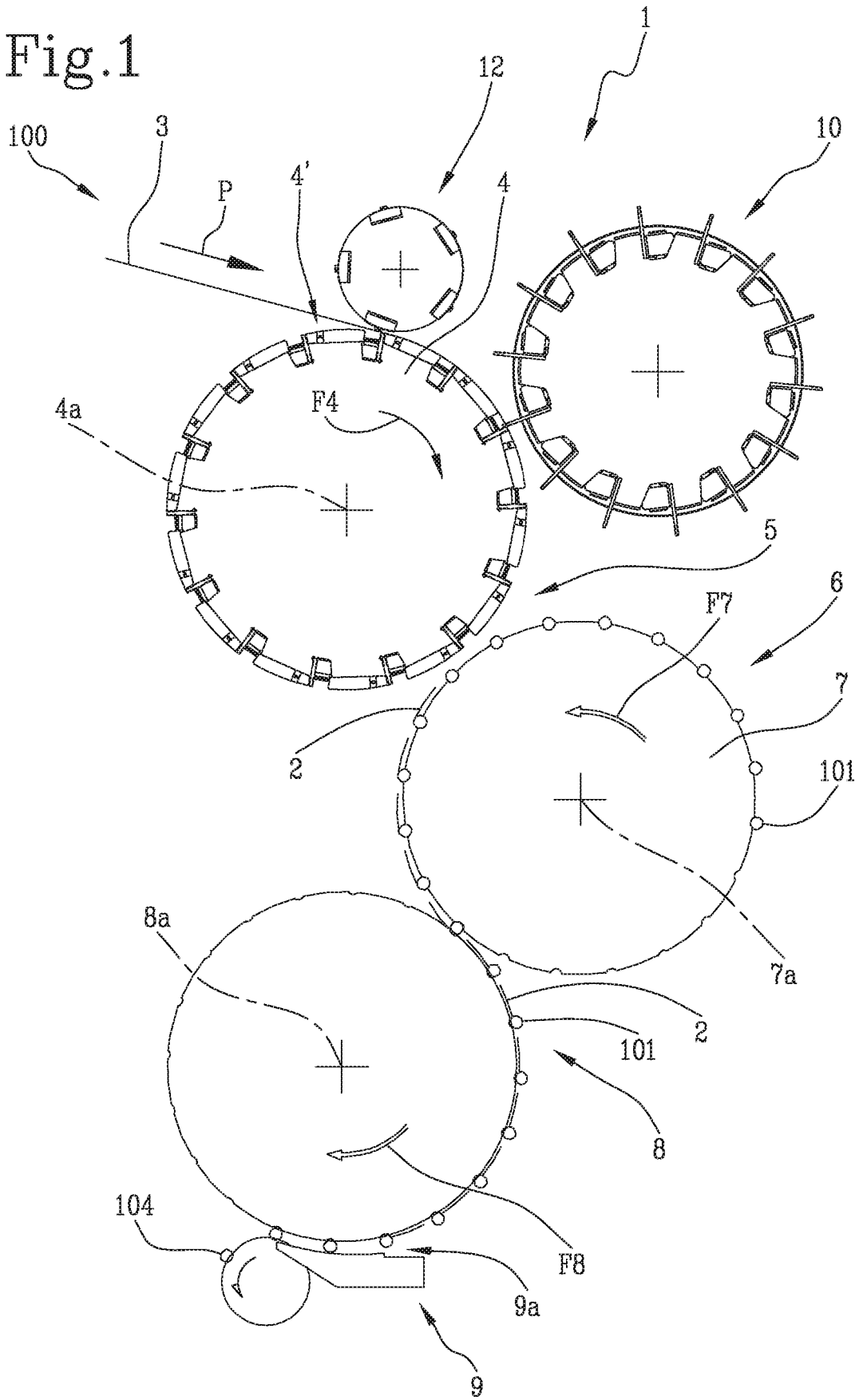
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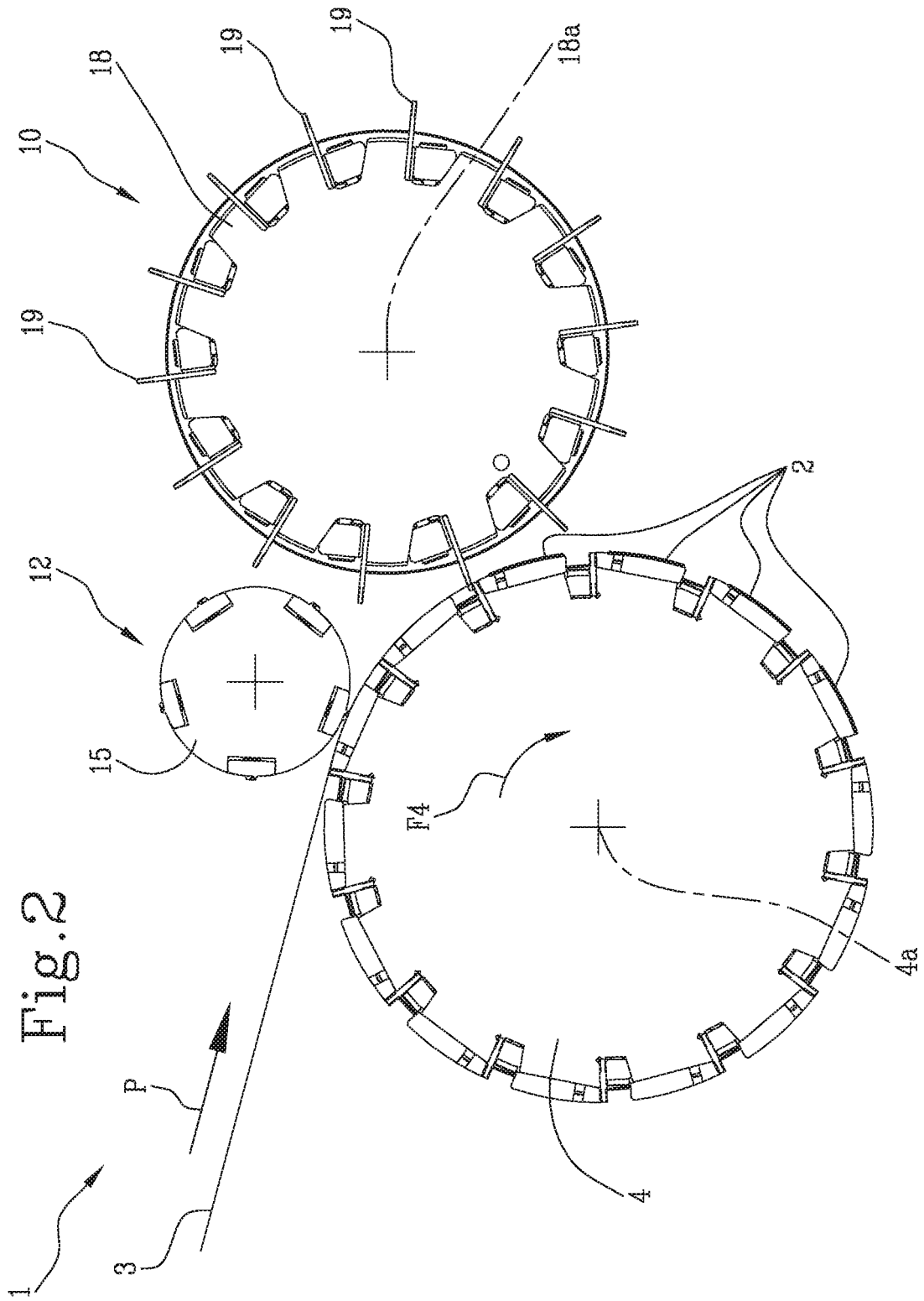
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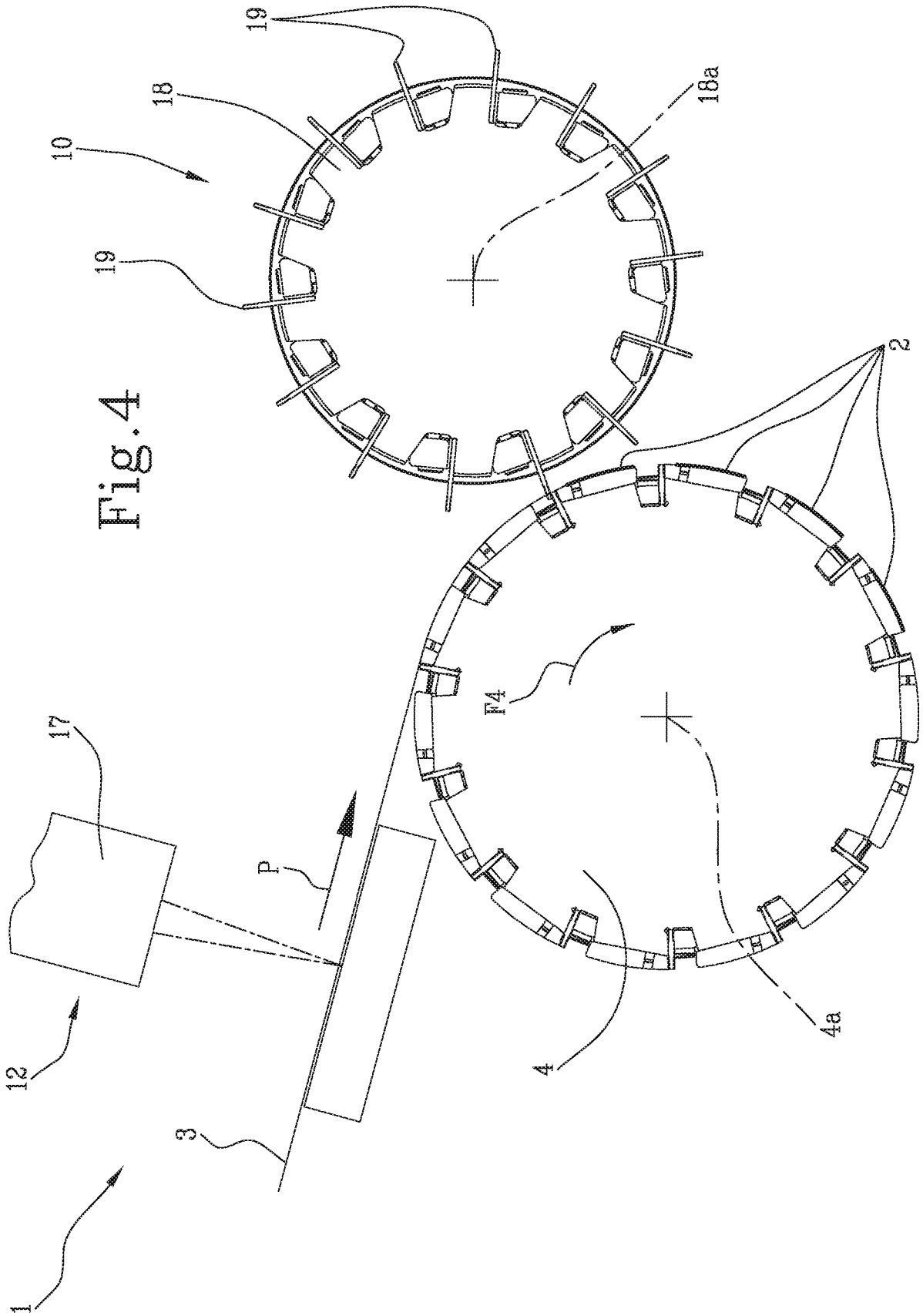
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Fig.1







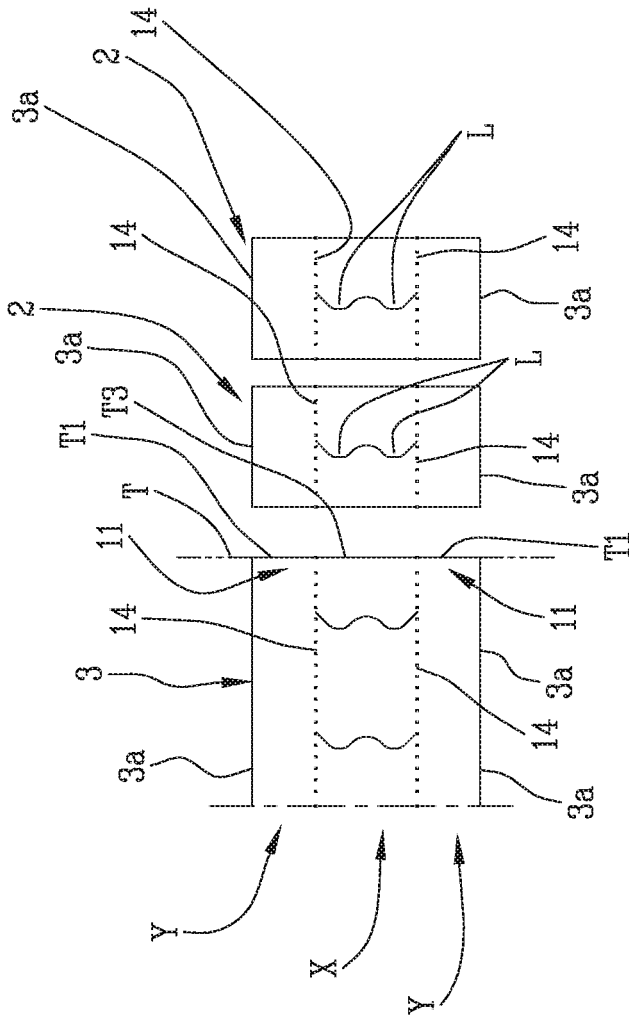


Fig. 5A

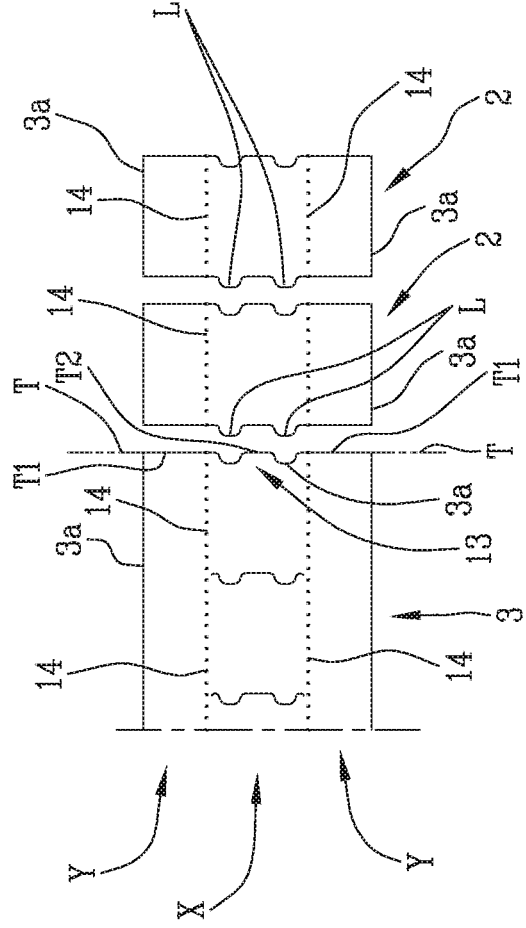


Fig. 5B

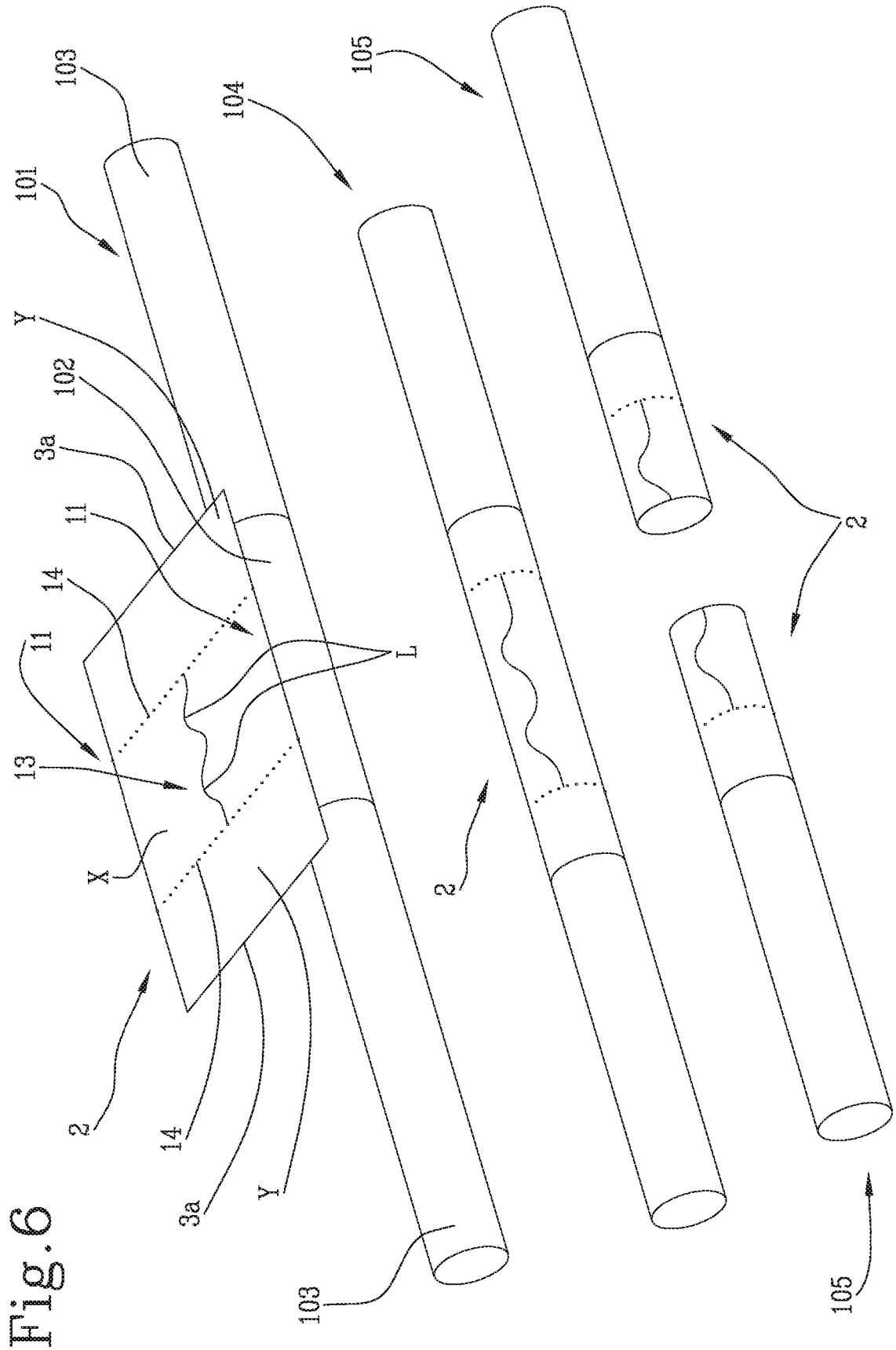


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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