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(72) Inventors:
• **Cooper, Edward**
22761 Hamburg (DE)
• **Rieth, Fabian**
22761 Hamburg (DE)

(74) Representative: **Gulde & Partner**
Patent- und Rechtsanwaltskanzlei mbB
Wallstraße 58/59
10179 Berlin (DE)

(71) Applicant: **Reemtsma Cigarettenfabriken GmbH**
22761 Hamburg (DE)

(54) **CIGARETTE PACK**

(57) A method of packaging cigarettes (14) into a cigarette pack (22) includes the step of bundling (S1) a plurality of cigarettes to form a cigarette bundle (10). By bundling, an orientation of the cigarettes in the cigarette bundle with respect to each other is fixed. In a further step, after bundling, at least one of the cigarettes of the

cigarette bundle (10) is provided (S2) with a marking (16).

The cigarette bundle (10) including the marking (16) can be packaged (S3) into the cigarette pack (22), wherein the marking is arranged on the at least one cigarette of the cigarette bundle so as to be visible from the outside of the cigarette pack when the cigarette pack is opened.

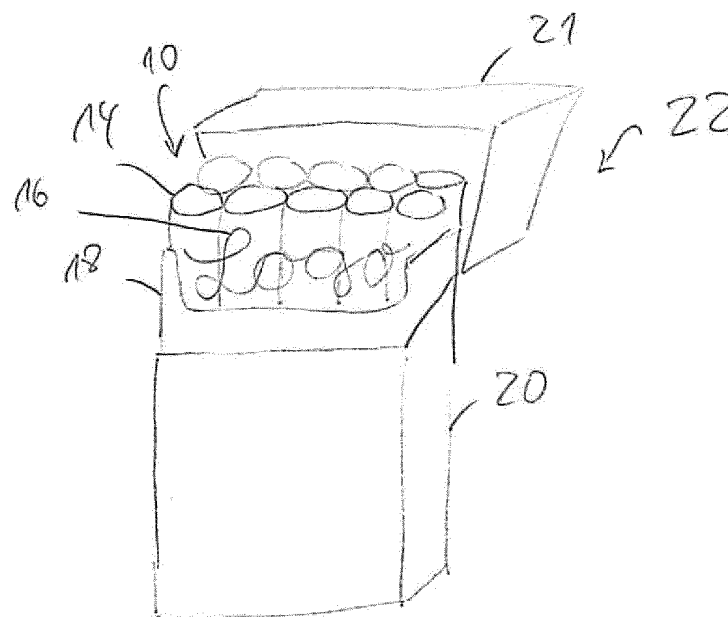


Fig. 4

DescriptionFIELD OF INVENTION

5 **[0001]** The present invention relates generally to a method of packaging cigarettes into a cigarette pack, a respective cigarette pack and a packaging machine for packaging cigarettes.

BACKGROUND OF THE INVENTION

10 **[0002]** Common cigarette packs, such as hinge-lid boxes or soft-cup packs, are generally provided with information on an outer surface of the cigarette pack. Such information, e.g. in printed form, can include branding, consumer information and communication, health warnings, and the like.

[0003] It is an object of the present invention to broaden the potential of providing information to a consumer of cigarettes.

15 SUMMARY OF THE INVENTION

[0004] In accordance with one aspect of the present invention there is provided a method of packaging cigarettes into a cigarette pack. The method includes a step of bundling a plurality of cigarettes to form a cigarette bundle. By bundling the cigarettes, an orientation of the cigarettes in the cigarette bundle with respect to each other is fixed, i.e. the cigarettes in the cigarette bundle are immobilized so that relative movement with respect to each other is no longer possible. After bundling, in a further step of the method, at least one of the cigarettes of the cigarette bundle is provided with a marking.

20 **[0005]** According to a first alternative, the step of bundling includes at least partially wrapping the plurality of cigarettes with an inner wrapper and/or an inner frame. The inner wrapper or inner frame can e.g. be formed from paper, thin carton, foil or the like. The area of the at least one cigarette to be provided by the marking is preferably left open, i.e. not covered by the wrapping material.

25 **[0006]** According to a second alternative, the step of bundling includes immobilizing the cigarettes of the cigarette bundle by means of an immobilizing element of a bundling station of a packaging machine. The immobilizing element can e.g. include a gripper or the like, by means of which a plurality of cigarettes is bundled and firmly kept together, thereby forming a cigarette bundle in which an orientation of the cigarettes with respect to each other is fixed.

30 **[0007]** According to a preferred embodiment, the immobilizing element includes a generally U-shaped receiving element, which is configured to receive the plurality of cigarettes to be bundled. The receiving element can further be provided with a hinged cover element, which is configured to hold down and thereby fix the cigarettes received by the receiving means. Preferably, the cover element only partly covers the cigarettes so as to leave uncovered an area to be provided with the marking.

35 **[0008]** According to a preferred embodiment, the marking is produced by means of laser energy. Different kinds of lasers can be used for marking, such as a CO₂ laser, a Nd:YAG laser or a fiber laser. Preferably, the laser used for marking works in the IR spectral range, preferably in the spectral range between 9 μm to 12 μm, most preferably between 9,3 μm and 10,6 μm.

40 **[0009]** In case the marking is provided by means of a laser and bundling is performed by means of wrapping the plurality of cigarettes with a wrapping material that is not absorptive in the spectral range used by the laser, the cigarettes may be completely wrapped in the wrapping material, because the marking can then be provided on the cigarettes through the wrapping material.

[0010] Other suitable types of marking technologies can generally be used in order to produce the marking.

45 **[0011]** According to one embodiment, the marking can be provided by means of a specific printing cylinder, the surface of which is adapted to the surface of the cigarette bundle.

[0012] According to another embodiment, the marking can be provided by means of a spraying or sputtering element, preferably in combination with a stencil or the like.

[0013] According to still another embodiment, an ink jet printer can be used for marking purposes.

50 **[0014]** Preferably, before producing a laser marking, the at least one cigarette is provided with a light sensitive layer at least in the area of the laser marking. By means of this light sensitive layer, the accuracy and the effect of the laser marking can be enhanced. Also, energy needed to produce the laser marking can be optimized.

55 **[0015]** According to a preferred embodiment, the marking extends over at least two cigarettes of the cigarette bundle. Generally, according to this embodiment, a first portion of the marking that is provided on a first cigarette of the at least two cigarettes differs from a second portion of the marking that is provided on a second cigarette of the at least two cigarettes. The respective portions of the marking can e.g. differ with respect to shape, color, orientation, or location.

[0016] The marking can include a logo, an image, a brand name, or a lettering that extends over at least two cigarettes. The marking can include a continuous image or lettering, or can be comprised of a plurality of separated discrete portions.

[0017] According to a preferred embodiment, at least part of the marking is located on a tipping paper of the at least

one cigarette. Alternatively or additionally, other parts of the at least one cigarette can be provided with the marking.

[0018] The method can further comprise a step of packaging the cigarette bundle into the cigarette pack. In this case, the marking is arranged on the at least one cigarette of the cigarette bundle so as to be visible from the outside of the cigarette pack when the cigarette pack is opened.

[0019] By means of the present invention, an additional area to be provided with information is created with respect to a cigarette pack. No longer only the outer surface of the cigarette pack can be provided with information, but also the cigarettes itself. Due to the step of bundling the cigarettes before marking, and thereby immobilizing the cigarettes with respect to each other, markings can be provided to extend over a plurality of cigarettes, without the danger that the marking becomes unreadable or even invisible due to individual movement of the cigarettes with respect to each other after the marking has been provided. Such a marking, when the cigarette bundle is packed into a cigarette pack, such as a hinge-lid box, can extend over the entire top front row of a cigarette bundle and can e.g. become visible when the cigarette pack is opened.

[0020] In accordance with another aspect of the present invention, there is provided a cigarette bundle. The cigarette bundle is configured to be packaged into a cigarette pack, such as a hinge-lid box or a soft-cup pack, and comprises a plurality of cigarettes. An orientation of the cigarettes in the cigarette bundle is fixed with respect to each other. At least one of the cigarettes of the cigarette bundle is provided with a marking.

[0021] According to a preferred embodiment, the marking is a laser marking.

[0022] According to another embodiment, the marking is produced by printing or spraying.

[0023] The marking can include a logo, an image, a brand name, or a lettering that extends over at least two cigarettes of the cigarette bundle.

[0024] According to a preferred embodiment, the marking is arranged on the at least one cigarette of the cigarette bundle so as to be visible from the outside of the cigarette pack, when the cigarette bundle is packaged into the cigarette pack, and when the cigarette pack is opened.

[0025] The cigarette bundle can in particular be produced using the above-described inventive method.

[0026] According to another aspect of the invention, a cigarette pack is provided, said cigarette pack includes an inventive cigarette bundle.

[0027] According to still another aspect of the present invention, a packaging machine for packaging cigarettes is provided. The packaging machine includes a bundling station that is configured to bundle a plurality of cigarettes to form a cigarette bundle. By bundling, an orientation of the cigarettes in the cigarette bundle with respect to each other is fixed. The packaging machine further includes, downstream the bundling station, a marking station that is configured to provide at least one of the cigarettes of the cigarette bundle with a marking.

[0028] According to an embodiment, the bundling station is configured to form a cigarette bundle by at least partially wrapping the plurality of cigarettes with an inner wrapper and/or an inner frame.

[0029] According to another embodiment, the bundling station includes an immobilizing element, which is configured to receive, bundle and firmly keep together a plurality of cigarettes. According to a preferred embodiment, the immobilizing element includes a U-shaped receiving element, which is configured to receive a plurality of cigarettes to be bundled. The receiving element can further be provided with a hinged cover element, which is configured to hold down and thereby fix the cigarettes received by the receiving element. Preferably, the cover element only partly covers the cigarettes so as to leave uncovered an area to be provided with the marking.

[0030] According to a preferred embodiment, the marking station includes a laser station that is configured to provide the at least one cigarette of the cigarette bundle with a laser marking.

[0031] According to another embodiment, the marking station can include a printing cylinder, which is adapted to print a logo onto cigarettes of the cigarette bundle. Preferably, the geometry of the printing surface of the printing cylinder is adapted to the geometry of the surface of the cigarette bundle.

[0032] According to still another embodiment, the marking station can include a spraying station, which is configured to spray suitable color or ink, preferably through one or more openings of a stencil, in order to provide the cigarette bundle with the marking.

[0033] According to still another embodiment, the marking station can include an ink jet printer.

[0034] The packaging machine may further comprise an outer pack forming station that is configured to form an outer box or outer pack of the cigarette pack. The outer pack accommodates the cigarette bundle. The outer pack forming station is arranged downstream of the marking station.

[0035] The characteristics, features and advantages of this invention and the manner in which they are obtained as described above, will become more apparent and be more clearly understood in connection with the following description of exemplary embodiments, which are explained with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] In the drawings, same element numbers indicate same elements in each of the views:

- Figure 1 is a perspective view of a first embodiment of a cigarette bundle including a marking;
- Figure 2 is a perspective view of a second embodiment of a cigarette bundle including a marking;
- 5 Figure 3 is a perspective view of a third embodiment of a cigarette bundle (without a marking);
- Figure 4 is a perspective view of a cigarette pack including a cigarette bundle with a marking;
- Figure 5 schematically shows elements of a cigarette packaging machine;
- 10 Figures 6A and 6B schematically illustrate a marking unit according to one embodiment;
- Figure 7 schematically shows a marking unit according to another embodiment; and
- 15 Figure 8 schematically lists steps of a method of packaging cigarettes.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0037] Figure 1 is a perspective view of a first embodiment of a cigarette bundle 10 including a marking 16. The cigarette bundle 10 includes a plurality of cigarettes 14 which are bundled by means of a wrapper 12. By bundling, in the example by means of the wrapper 12, the cigarettes 14 are immobilized so that relative movement of the cigarettes 14 with respect to each other is prevented.

[0038] The wrapper 12 can be formed from paper, plastic foil or any other suitable material. As can be seen from Fig. 1, the cigarettes 14 of the bundle 10 are only partially wrapped by the wrapper 12. An upper area, including the tipping paper of the cigarettes 14, is left out, i.e. is left unwrapped, in order to allow providing the cigarettes 14 with a marking 16 in this area.

[0039] The marking 16 is preferably produced by means of laser energy, as described in more detail below with reference to Fig. 5. Alternative marking techniques, such as printing or spraying/sputtering, can be used.

[0040] In the example, the marking 16 continuously extends over a plurality of cigarettes 14 of the cigarette bundle 10, and includes a logo. Additionally or alternatively, the marking 16 may also include an image, a brand name, a lettering or the like.

[0041] As can be seen from Fig. 1, a first portion of the marking 16, e.g. the portion on the most left cigarette 14, differs from a second portion of the marking that is provided on a second cigarette, e.g. the cigarette directly adjacent to the first cigarette or any other cigarette of the cigarette bundle 10. The same effect is shown in Fig. 2 with respect to the different discrete marking portions 16'a to 16'e of the marking 16'.

[0042] Figure 2 is a perspective view of a second embodiment of a cigarette bundle 10' including a marking 16'.

[0043] The embodiment according to Fig. 2 differs from the cigarette bundle 10 according to Fig. 1 in that according to Fig. 2 the cigarettes 14 are bundled by means of an inner frame 18. The inner frame 18 can be formed from paper or thin carton material in a commonly known manner.

[0044] The logo 16', which again extends over a plurality of cigarettes 14, in contrast to the continuous logo 16 of Fig. 1, includes separate discrete (and different) portions 16'a, 16'b, 16'c, 16'd, 16'e, each of which is provided on a single cigarette 14 of the cigarette bundle 10'. Only in combination, and having the relative orientation shown in Fig. 2, the different marking portions 16'a, 16'b, 16'c, 16'd, 16'e allow correct recognition of the entire logo 16'. The same is true with respect to the logo 16 of Fig. 1.

[0045] Figure 3 is a perspective view of a third embodiment of a cigarette bundle 10", without a marking.

[0046] The cigarette bundle 10" according to Fig. 3 is not formed by permanently wrapping a plurality of cigarettes 14 by some kind of wrapping material, as described with reference to Fig. 1 and 2. In contrast, according to Fig. 3, the cigarette bundle 10" is formed by temporarily bundling the plurality of cigarettes 14 using an immobilizing element 30, 32 of a bundling station of a cigarette packing machine (cf. Fig. 5). The immobilizing element 30, 32 is configured to receive, bundle and firmly keep together a plurality of cigarettes 14. According to a preferred embodiment, which is shown in Fig. 3, the immobilizing element 30, 32 includes a generally U-shaped receiving element 30, which is configured to receive a plurality of cigarettes 14 to be bundled. The receiving element 30 is provided with a hinged cover element 32, which is configured to hold down and thereby fix the cigarettes 14 received by the receiving element. Preferably, the cover element 32 only partly covers the cigarettes 14, as shown in Fig. 3, so as to leave uncovered an area to be provided with the marking (not shown in Fig. 3).

[0047] Figure 4 is a perspective view of a cigarette pack 22 including a cigarette bundle 10 with a marking 16. In addition to the inner frame 18, the cigarette pack 22 includes an outer box 20, including a lid 21. As can be seen from Fig. 3, the marking 16 is arranged on the cigarettes 14 of the cigarette bundle 10 so as to be visible from the outside of

the cigarette pack 22 when the cigarette pack 22 is opened. An optional inner liner of the cigarette bundle, which is commonly known, is not shown in Fig. 4, however, the marking 16 would be visible once a consumer pulls off a flap of such an inner liner in a known manner.

[0048] Figure 5 schematically shows elements of a cigarette packaging machine 100. The cigarette packaging machine 100 includes a bundling station 110, a marking station 120 and an outer pack-forming station 130. Cigarette bundles 10 can be transported between the different stations by means of a suitable conveyor 140, such as a conveyor belt.

[0049] Preferably, the marking station 120 is configured to provide a cigarette bundle 10 with a marking 16 while the cigarette bundle 10 is linearly transported by means of the conveyor 140.

[0050] The bundling station 110 is configured to bundle a plurality of cigarettes 14 to form a cigarette bundle 10. By bundling, an orientation of the cigarettes in the cigarette bundle with respect to each other is fixed. Bundling can e.g. be carried out, as shown in Fig. 1 and 2, by means of a wrapper 12 or an inner frame 18. Alternatively, the bundling station may include some kind of immobilizing element 30, 32 (as shown in Fig. 3), by means of which the plurality of cigarettes are bundled and firmly kept together.

[0051] Downstream of the bundling station 110, the marking station 120 is provided. The marking station is configured to provide at least one of the cigarettes 14 of the cigarette bundle 10 with a marking 16.

[0052] According to an embodiment not shown, the bundling station and the marking station can be integrated into a bundling and marking station. Also with respect to this embodiment, first a plurality of cigarettes 14 are bundled, and then the cigarette bundle 10 is provided with the marking 16.

[0053] In the embodiment according to Fig. 5, the marking station 120 includes a laser station that is configured to provide the at least one cigarette of the cigarette bundle 10 with a laser marking. The laser station can e.g. include a CO₂ laser, a Nd:YAG laser or a fiber laser. The laser station is preferably configured to work in the IR spectral range. Alternative marking stations are described below with reference to Figs. 6 and 7.

[0054] The outer pack-forming station 130 is configured to form an outer box or outer pack 20, 21 of the cigarette pack 22, the outer pack 20, 21 accommodating the cigarette bundle 10. The outer pack-forming station 130 is arranged downstream of the marking station 120, i.e. the outer pack is formed after the marking has been provided. Forming an outer pack as e.g. shown in Fig. 4 is generally known in the art.

[0055] According to an embodiment (not shown), the marking station 120 can also form part of the outer pack-forming station 130 or can be provided in the outer pack-forming station 130. According to this embodiment, the marking 16 is provided on the cigarette bundle 10 while the cigarette bundle 10 is already partly provided with the outer pack, but not completely covered, e.g. while the cigarette bundle 10 is transported by means of a so called folding turret of the outer pack-forming station, said folding turret is used to form the outer pack.

[0056] Figures 6A and 6B schematically illustrate a marking unit 120' according to one embodiment in perspective view (Fig. 6A) and in front view (Fig. 6B).

[0057] The marking unit 120' includes a printing cylinder, which is configured to print a marking "Logo" (cf. Fig. 6B) onto the cigarettes 14 forming the top layer of the cigarette bundle 10. To that end, the geometry of the printing surface of the printing cylinder is adapted to the geometry of the top surface of the cigarette bundle 10, as can be seen in Fig. 6B.

[0058] Figure 7 schematically shows a marking unit 120" according to another embodiment.

[0059] The marking station 120" includes a spraying station, which is configured to spray or sputter suitable color or ink through one or more openings of a stencil 122, the openings 124 defining the appearance of the marking "Logo", while the cigarette bundle 10 is located below the stencil 122.

[0060] Figure 8 schematically lists steps of a method of packaging cigarettes. In step S1, as already described above, a plurality of cigarettes 14 is bundled to form a cigarette bundle 10, wherein, by bundling, an orientation of the cigarettes 14 in the cigarette bundle 10 with respect to each other is fixed. Bundling can include partially wrapping the plurality of cigarettes 14 with an inner wrapper 12 or an inner frame 18, or immobilizing the cigarettes 14 of the cigarette bundle 10 by means of an immobilizing element 30, 32 of a bundling station 110 of a packaging machine 100.

[0061] In step S2, after bundling, at least one of the cigarettes 14 of the cigarette bundle 10 is provided with a marking 16, preferably with a laser marking using a laser marking station. Prior to providing the laser marking, in an optional step (not shown), the at least one cigarette 14 can be provided with a light-sensitive layer in the area of the marking 16, e.g. in the area of the tipping paper.

[0062] In step S3, the cigarette bundle 10 is packaged into a cigarette pack 22, e.g. a hinge-lid box as shown in Fig. 4. The marking 16 is arranged on the at least one cigarette 14 of the cigarette bundle 10 so as to be visible from the outside of the cigarette pack 22 when the cigarette pack is opened.

[0063] While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the scope of the appended claims.

LIST OF REFERENCE SIGNS**[0064]**

5	10, 10', 10"	cigarette bundle
	12	inner wrapper
	14	cigarette
	16, 16'	marking
	16a, 16b, 16c, 16d, 16e	marking portion
10	18	inner frame
	20	outer pack
	21	lid
	22	cigarette pack
	30	receiving element
15	32	hinged cover
	100	cigarette packaging machine
	110	bundling station
	120, 120', 120"	marking station
	122	stencil
20	124	opening
	130	outer pack forming station
	140	conveyor
	S1, S2, S3	method steps

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Claims

1. A method of packaging cigarettes into a cigarette pack (22), including the steps of

- 30 - bundling (S1) a plurality of cigarettes (14) to form a cigarette bundle (10), wherein, by bundling, an orientation of the cigarettes (14) in the cigarette bundle (10) with respect to each other is fixed;
 - after bundling, providing (S2) at least one of the cigarettes (14) of the cigarette bundle (10) with a marking (16).

2. The method of claim 1, wherein the step of bundling includes

- 35 - at least partially wrapping the plurality of cigarettes (14) with an inner wrapper (12) and/or an inner frame (18); or
 - immobilizing the cigarettes (14) of the cigarette bundle (10) by means of an immobilizing element (30; 32) of a bundling station (110) of a packaging machine (100).

40 3. The method according to claim 1 or 2, wherein

- the marking (16) is produced by means of laser energy, and wherein before producing the laser marking (16), the at least one cigarette (14) is preferably provided with a light-sensitive layer in the area of the laser marking (16), or
 45 - wherein the marking is produced by printing; or
 - wherein the marking is produced by spraying or sputtering.

4. The method according to any one of claims 1 to 3, wherein the marking (16') extends over at least two cigarettes (14) of the cigarette bundle, and wherein preferably a first portion (16'a) of the marking that is provided on a first cigarette of the at least two cigarettes differs from a second portion (16'b) of the marking that is provided on a second cigarette of the at least two cigarettes, in particular with respect to shape, color, orientation or location.

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5. The method of claim 4, wherein the marking (16) includes a logo, an image, a brand name or a lettering that extends over at least two cigarettes.

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6. The method according to any one of the claims 1 to 5, wherein at least part of the marking (16) is located on a tipping paper of the at least one cigarette (14).

7. The method according to any one of claims 1 to 6, further comprising

- packaging (S3) the cigarette bundle (10) into the cigarette pack (22),

wherein the marking (16) is arranged on the at least one cigarette (14) of the cigarette bundle (10) so as to be visible from the outside of the cigarette pack (22) when the cigarette pack is opened (22).

8. A cigarette bundle (10), configured to be packaged into a cigarette pack (22), such as a hinge-lid box, wherein the cigarette bundle (10) comprises a plurality of cigarettes (14), wherein an orientation of the cigarettes (14) in the cigarette bundle (10) is fixed with respect to each other, and wherein at least one of the cigarettes (14) of the cigarette bundle (10) is provided with a marking (16).

9. The cigarette bundle (10) according to claim 8, wherein the marking (16) is a laser marking, a printed marking, or a sprayed marking.

10. The cigarette bundle (10) according to claim 8 or 9, wherein the marking (16) includes a logo, an image, a brand name or a lettering that extends over at least two cigarettes (14) of the cigarette bundle (10).

11. The cigarette bundle (10) according to any one of claims 8 to 10, wherein the marking (16) is arranged on the at least one cigarette (14) of the cigarette bundle so as to be visible from the outside of the cigarette pack (22), when the cigarette bundle (10) is packaged into the cigarette pack (20), when the cigarette pack (22) is opened.

12. The cigarette bundle (10) according to any one of claims 8 to 11, wherein the cigarette bundle (10) is produced using a method according to any one of claims 1 to 7.

13. A cigarette pack (22), including a cigarette bundle (10) according to any one of claims 8 to 12.

14. A packaging machine (100) for packaging cigarettes, the packaging machine (100) including

- a bundling station (110) that is configured to bundle a plurality of cigarettes (14) to form a cigarette bundle (10), wherein, by bundling, an orientation of the cigarettes (14) in the cigarette bundle (10) with respect to each other is fixed; and,

- downstream of the bundling station (110), a marking station (120) that is configured to provide at least one of the cigarettes (14) of the cigarette bundle (10) with a marking (16), wherein the marking station (120) preferably includes

- a laser station that is configured to provide the at least one cigarette (14) of the cigarette bundle (10) with a laser marking (16); or

- a printing station (120') including a printing cylinder or an ink jet printer, said printing station is configured to provide the at least one cigarette (14) of the cigarette bundle (10) with a printed marking; or

- a spraying station (120'') that is configured to provide the at least one cigarette (14) of the cigarette bundle (10) with a sprayed marking.

15. The packaging machine (100) of claim 14, further comprising

- and outer pack forming station (130) that is configured to form an outer pack (20; 21) of the cigarette pack (22), the outer pack (20; 21) accommodating the cigarette bundle (10),

wherein the outer pack forming station (130) is arranged downstream of the marking station (120).

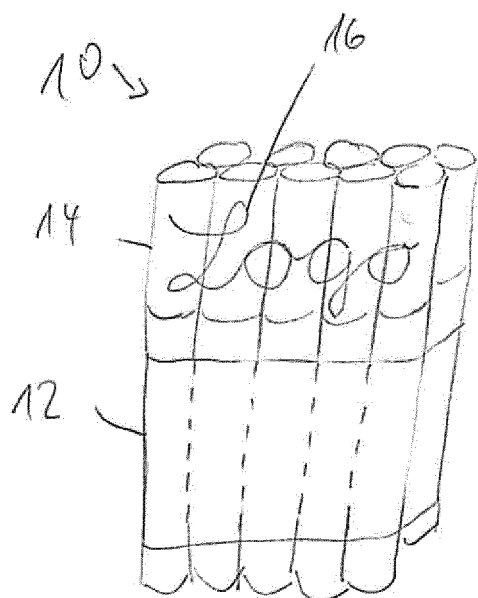


Fig. 1

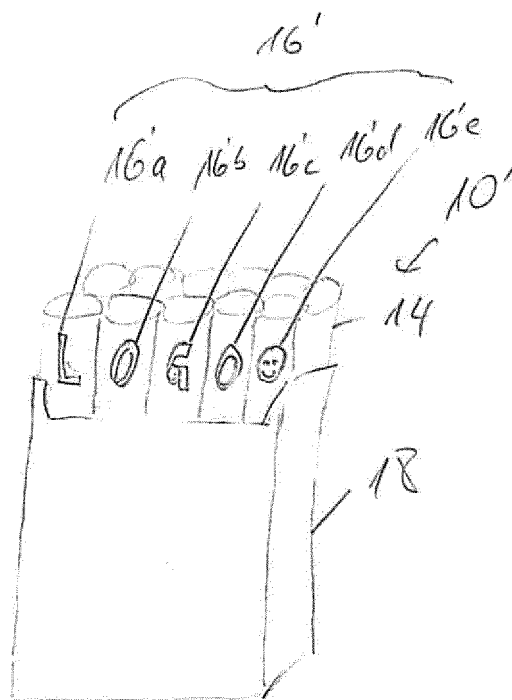


Fig. 2

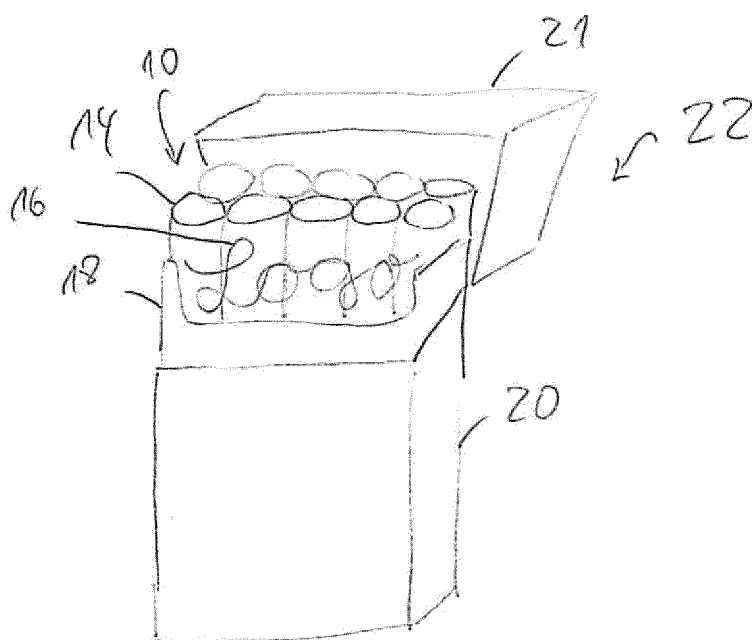


Fig. 4

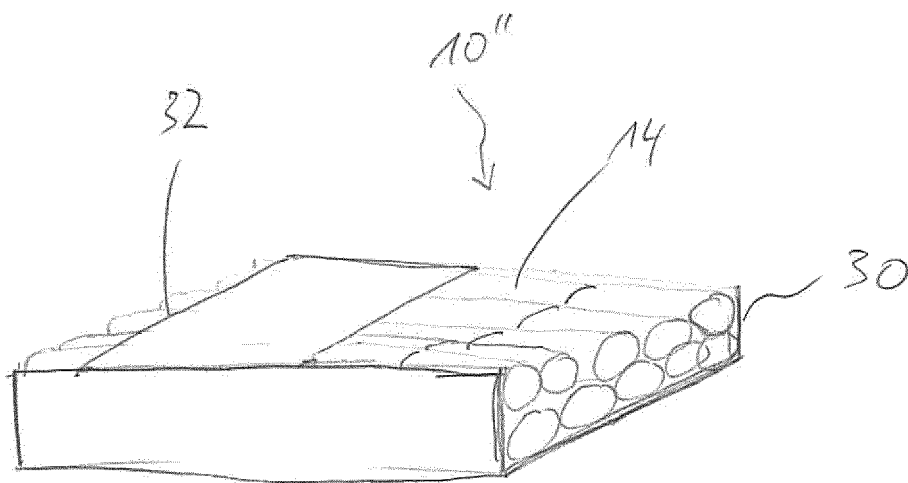


Fig. 3

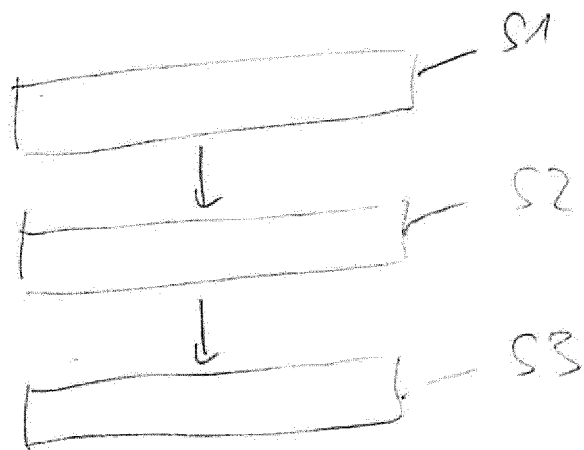
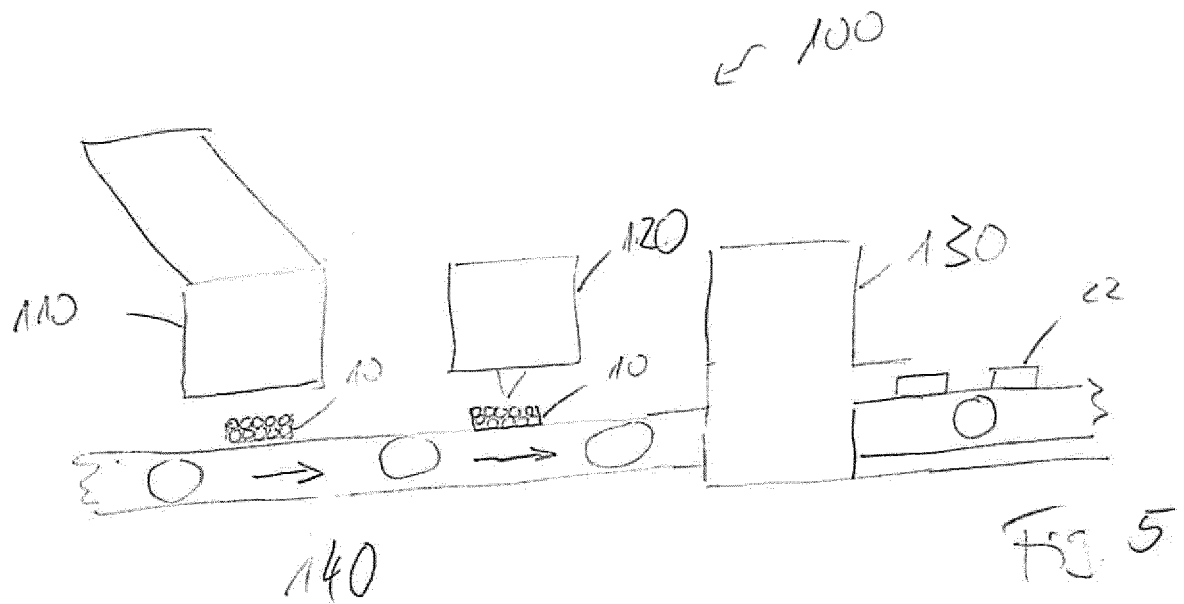


Fig. 8

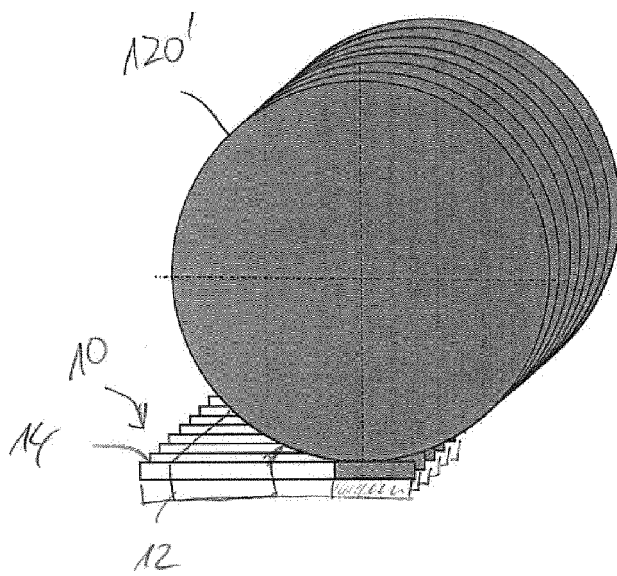


Fig. 6A

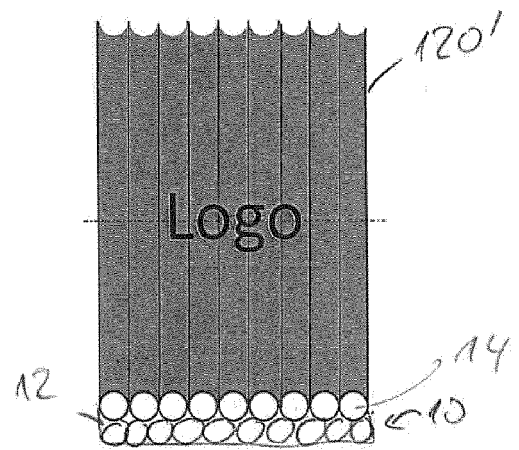


Fig. 6B

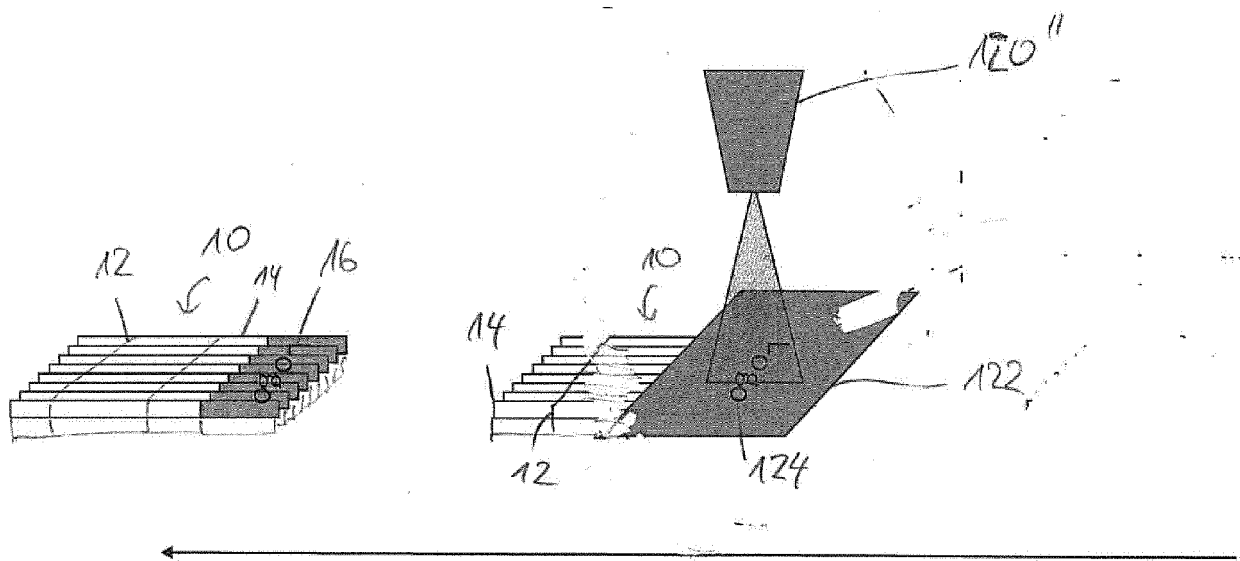


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
EP 17 15 4792

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Place of search Munich		Date of completion of the search 18 July 2017	Examiner Weyand, Tim
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EPO FORM 1503 03/82 (P04C01)

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