



- (51) International Patent Classification:
A24C 5/24 (2006.01) *A24D 3/02* (2006.01)
- (21) International Application Number:
PCT/IB2014/063574
- (22) International Filing Date:
31 July 2014 (31.07.2014)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
PL405050 12 August 2013 (12.08.2013) PL
- (71) Applicant: **INTERNATIONAL TOBACCO MA-
CHINERY POLAND SP. Z O.O.** [PL/PL]; 19a,
Warsztatowa, PL-26-600 Radom (PL).
- (72) Inventor: **CIEŚLIKOWSKI, Bartosz**; Warsztatowa, 19a,
PL-26-600 Radom (PL).
- (74) Agent: **MARKIETA, Jarosław**; Warszawa, 5A lok. 23,
Wańkowicza, PL-02-796 Warszawa (PL).
- (81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,

HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,
ZW.

- (84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to the identity of the inventor (Rule 4.17(i))
- as to applicant's entitlement to apply for and be granted a
patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report (Art. 21(3))

[Continued on next page]

- (54) Title: METHOD AND APPARATUS FOR APPLICATION OF GLUE

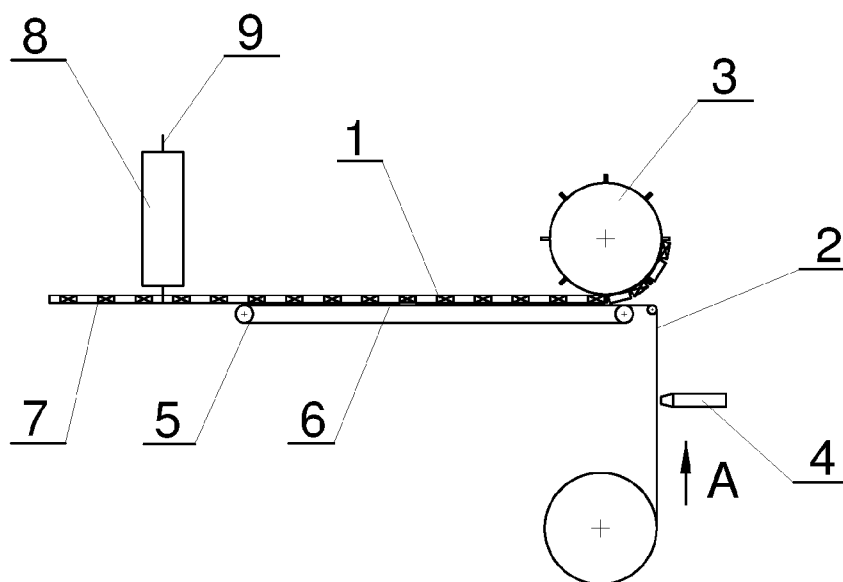


Fig. 1

- (57) Abstract: The object of the invention is a method and an apparatus for application of glue by means of a glue nozzle onto a pa-
per wrapper for wrapping of rod-shaped articles on a manufacturing machine of the tobacco industry characterized in that during the
operation of the machine the place of application of a glue path is changed relative to a lateral edge of the paper wrapper.



-
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

METHOD AND APPARATUS FOR APPLICATION OF GLUE

The object of the invention is a method and an apparatus for application of glue.

In the tobacco industry, there are used machines for manufacturing filter rods used to manufacture filter cigarettes. Currently are used both filters made of a single filter material and of multiple different materials, so-called multi-segment filters. Rods containing a single kind of filter material are formed by cutting a continuous filter rod which is formed by wrapping a filter fiber strand into a wrapping paper. In the subsequent production process the rods are cut into multiple individual filters applied to cigarettes. Multi-segment rods are formed by cutting a continuous filter rod which is formed by wrapping multiple segments of different filter materials. In both cases, a rotary cutting head with knives situated on its circumference is used for the cutting. In case of multi-segment rods the rods are cut off usually by cutting through one of the segments into halves. In the subsequent production process the multi-segment rods are cut into multiple individual multi-segment filters applied to cigarettes. In a finished cigarette, the first segment is adapted to be held by the smoker in his/her mouth. It is commonly expected that during smoking this segment does not fall out of a cigarette and fall into the smoker's mouth. With regard to filters made of a single material it is also expected that it will not move relative to the wrapping paper. A commonly used method of segment fixing is to glue them to the wrapping paper. At present, the cigarette manufacturers use various filter materials as well as various filter wrapping materials. From the viewpoint of adhesive bonding of filter materials and wrapping materials, a very significant issue is the spread of the adhesive in the space between the surfaces to be glued, and the penetration of the adhesive into the structures of both the wrapping paper and the filter material. In addition, the amount of glue fed and the method of glue distribution, i.e. guiding a glue path on the surface of the wrapping material yet before joining with the filter is to be considered. A difficult problem to be solved is the selection of the shape of glue path and the glue amount when the wrapping material used is very thin or perforated. If a segment being wrapped is porous, then the glue will permeate partially into the segment and partially into the material, however, if a segment is smooth then the glue will permeate into the wrapping material, but also penetrate outside. As a

result, the members in the manufacturing machines which guide a continuous multi-segment rod as well as a multi-segment rod formed by cutting the continuous rod will be contaminated with glue. The glue depositing on the members of the machine has to be removed, which makes it necessary to stop the manufacturing machine. The objective of this invention is to develop such method of application of glue
5 which ensures a reduction of contamination of the members of the manufacturing machine.

Manufacturing machines provided with nozzles feeding the glue to fix the segments of manufactured multi-segment rods are known in the prior art. The document DE2452749 presents a manufacturing machine on which a double glue path is formed. Also the document US2012/0305014 discloses a manufacturing machine on which glue paths for segment fixing are made. The solutions presented above do not solve
10 the problem of machine contamination in case of the necessity to use segments with a porous surface structure and the segments with a smooth surface structure and at the same time a thin porous wrapping paper.

The object of the invention is a method of application of glue by means of a glue nozzle onto a wrapping paper for wrapping of rod-shaped articles on a manufacturing machine of the tobacco industry
15 characterized in that during the operation of the machine the place of application of a glue path is shifted relative to a lateral edge of the paper wrapper.

Furthermore, a method according to the invention is characterized in that the place of application of the glue path is shifted by changing the position of a glue nozzle.

A method according to the invention characterized in that the applied glue paths are linear sections
20 parallel to the lateral edge of the paper wrapper.

Furthermore, a method according to the invention is characterized in that a successive shift of the place of application of the glue path is greater than the width of the glue path.

Furthermore, a method according to the invention is characterized in that the distance between a successive position of the glue path and a present position of the glue path is different from the distance
25 between the present position of the glue path and the previous position of the glue path.

A method according to the invention is characterized in that the place of application of the glue path is shifted in a continuous way.

A method according to the invention is characterized in that the applied glue paths are linear sections inclined relative to the lateral edge of the paper wrapper.

30 A method of the invention is characterized in that the applied paths have a sinusoidal course.

Furthermore, a method according to the invention is characterized in that the place of application of the glue path is shifted at specific intervals.

Furthermore, a method according to the invention is characterized in that the position of a glue nozzle is shifted at half-minute intervals.

The substance of the invention is also an apparatus for the application of glue by means of a glue nozzle onto a paper wrapper for the wrapping of rod-shaped articles on a manufacturing machine of the tobacco industry, characterized by comprising a nozzle of a glue applying system which is adapted to apply a glue path at different places relative to a lateral edge of the paper wrapper.

Furthermore, an apparatus according to the invention is characterized in that the nozzle changes its position relative to the lateral edge of the paper wrapper.

Furthermore, an apparatus according to the invention is characterized in that the nozzle changes its inclination relative to the surface of the paper wrapper.

Due to the application of a method according to the invention the contamination caused by the permeating of the glue will appear at different places of the members of the machine designed for guiding of the articles. Due to the fact that the points of contamination appearing at different places will not be dried, they will be removed by moving articles. The application of a method according to the invention results in a reduction of production waste. At the same time, the efficiency of the manufacturing machine is increased by reducing the machine's shutdown time.

The developed method according to the invention was presented in detail in a preferred embodiment in a drawing in which:

Fig. 1 shows a fragment of a production machine for manufacturing of multi-segment rods;

Fig. 1a shows a fragment of an apparatus according to the invention with a nozzle adapted to changing its position.

Fig. 1b shows a fragment of an apparatus according to the invention with a nozzle adapted to changing of its inclination relative to the surface of a paper wrapper.

Fig. 2 shows a continuous multi-segment rod placed onto a paper wrapper on a manufacturing machine;

Fig. 3 shows a paper wrapper with a glue path applied;

Fig. 4 shows a paper wrapper with a different glue path applied;

Fig. 5 shows a paper wrapper with another glue path applied;

Fig. 6 shows an individual multi-segment filter to be applied to a cigarette.

Fig. 1 shows a fragment of a machine for manufacturing of multi-segment rods. Rod-shaped segments 1 are fed onto a paper wrapper 2 from any not shown segment feeding apparatus. For example, a member directly placing the segments 1 onto a paper wrapper can be a delivery wheel 3. A machine for manufacturing of multi-segment rods is provided with a conveyor 5 on which the paper wrapper 2 moves together with the tape 6. The segments 1 are fixed relative to the paper wrapper 2 by means of glue. A nozzle 4 is used to feed the glue onto the paper wrapper before placing the segments on it. After wrapping the segments 1 into the paper wrapper 2 and sealing the paper wrapper a continuous multi-segment rod is formed, which is cut into individual multi-segment rods 7 by means of a cutting head 8 provided with knives 9.

10 Fig. 1a shows a fragment of an apparatus according to the invention in a view A marked in Fig. 1, namely a glue nozzle 4 whose position relative to an edge 15 of the paper wrapper 2 is changed by means of a drive member 20. A drive member 20 may be any known mechanical, electromagnetic or pneumatic actuator which can take multiple positions. A change of position of the nozzle 4 will entail a change of position of the glue path 14 situated at a distance e from the edge 15.

15 Fig. 1b shows a fragment of an apparatus according to the invention in a view A marked in Fig. 1, comprising a glue nozzle 4 which is designed as a rotary nozzle. The nozzle 4 is driven by a drive member 20, the nozzle 4 can rotate around the axis of rotation 21 changing the angle α to the surface of the paper wrapper 2. A change of angular position of the nozzle 4 will entail a change of position of the glue path 14 situated at a distance e from the edge 15.

20 Fig. 2 shows a train of segments 11, 12 and 13, put alternately on a manufacturing machine, which are wrapped into a paper wrapper 2, whereas the segments are shown in a section. For example, the segment 11 has a porous outer surface into which the glue permeates easily, whereas the segments 12 and 13 have a smooth paper surface into which the glue permeates with more difficulty than in case of the segments 11. Fig. 3 shows a paper wrapper 2 onto which a train of segments of Fig. 2 is placed, whereas the paper wrapper has a glue path 14 applied. The glue path 14 is applied by means of a nozzle 4 which makes movements in the direction of the plane of the drawing in Fig. 1 or changes its angular position relative to the plane of the drawing, whereas the nozzle 4 can work in contact or without contact with the paper wrapper 2, whereas the applied sections of the glue path 14 are linear sections parallel to the lateral edge 15 of the paper wrapper 2. Fig. 3 shows a glue path 14 for several shifts of the nozzle 4 relative to the edge 15 of the paper wrapper 2, whereas each shift is greater than the width of the glue path 14. The first shift is made with the relocation d_1 by changing the distance e_1 from the edge 15 to e_2 , a next shift is made with the relocation d_2 by changing the distance from e_2 to e_3 , a successive shift is made with the relocation d_3 by changing the distance from e_2 to e_3 . In addition, the relocation d_2 is smaller than d_1 , and the relocation d_3 is smaller than d_2 . It is possible to make any changes of position of the nozzle 4 at any, for example half-minute, intervals.

35

Methods of application of glue where the place of application of glue changes in a continuous way are also possible. Fig. 4 shows a glue path 14' which is formed by continuous changing of position of the glue nozzle 4 relative to the lateral edge 15. The applied sections of the glue path 14' are linear sections inclined relative to the lateral edge 15 at the angle β so that a so-called triangular course of the glue path 14' is achieved. The turning points are situated at the distances e_{10} , e_{11} and e_{12} , whereas the distances e_{10} and e_{12} may have different values. If the distances e_{10} and e_{12} are equal to each other, a symmetrical course of the path is achieved. Fig. 5, in turn, shows a glue path 14'' which has a sinusoidal course. For the extreme positions of the glue nozzle the points of inflexion of the course at the distances e_{20} , e_{21} and e_{22} are achieved, whereas the distances e_{20} and e_{22} are usually equal to each other.

- 10 Multi-segment rods 7 are cut into sections constituting filters applied to cigarettes. Fig. 6 shows a section of a finished individual multi-segment filter which is formed of the segments 11, 12 and 13. The segment 12 is not cut, the segment 11A is formed by cutting the segment 11 into halves, and similarly the segment 13A is formed by cutting the segment 13 into halves. A glue path 14 is situated between the paper wrapper 2 and the segments 11A, 12 and 13A.

Patent claims

1. A method of application of glue by means of a glue nozzle onto a paper wrapper for wrapping of rod-shaped articles on a manufacturing machine of the tobacco industry,

characterized in that

5 during the operation of the machine the place of application of a glue path is shifted relative to a lateral edge of the paper wrapper.
2. A method as in claim 1 characterized in that the place of application of the glue path is shifted by changing the position of the glue nozzle.
3. A method as in claim 1 characterized in that the applied glue paths are linear sections parallel to
10 the lateral edge of the paper wrapper.
4. A method as in claim 3 characterized in that a successive shift of the place of application of the glue path is greater than the width of the glue path.
5. A method as in claim 3 or 4 characterized in that the distance between a successive position of the glue path and a present position of the glue path is different from the distance between the
15 present position of the glue path and the previous position of the glue path.
6. A method as in claim 1 characterized in that the place of application of the glue path is shifted in a continuous way.
7. A method as in claim 6 characterized in that the applied glue paths are linear sections inclined relative to the lateral edge of the paper wrapper.
- 20 8. A method as in claim 6 characterized in that the applied paths have a sinusoidal course.

9. A method as in any of the preceding claims characterized in that the place of application of the glue path is shifted at specific intervals.
10. A method as in claim 9 characterized in that the position of the glue nozzle is shifted at half-minute intervals.
- 5 11. An apparatus for the application of glue by means of a glue nozzle onto a paper wrapper for wrapping of rod-shaped articles on a manufacturing machine of the tobacco industry,

characterized by

comprising a nozzle of a glue applying system which is adapted to apply a glue path at different places relative to a lateral edge of the paper wrapper.

- 10 12. An apparatus as in claim 11 characterized in that the nozzle changes its position relative to the lateral edge of the paper wrapper.
13. An apparatus as in claim 11 or 12 characterized in that the nozzle changes its inclination relative to the surface of the paper wrapper.

1/4

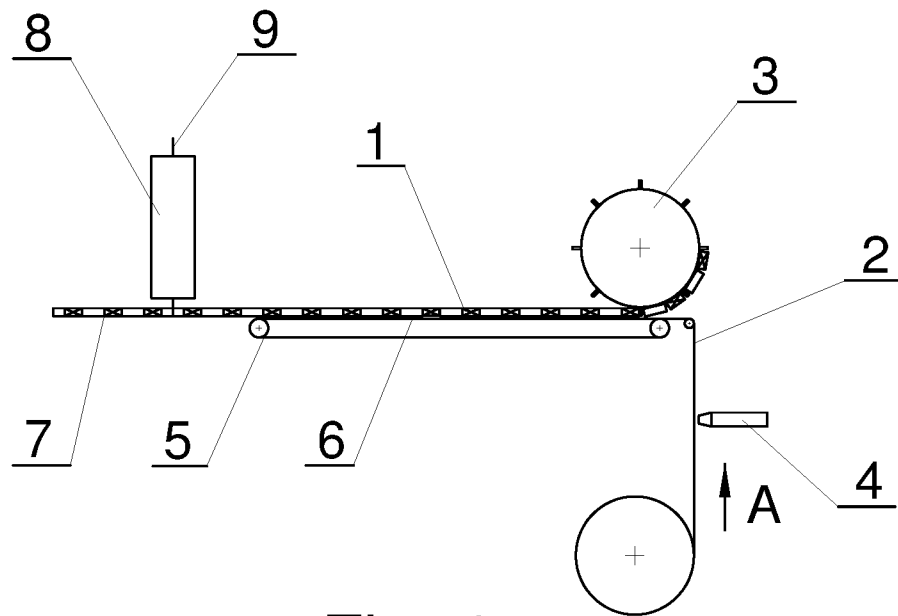


Fig. 1

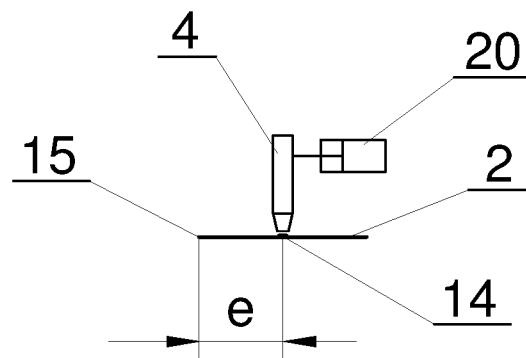


Fig. 1a

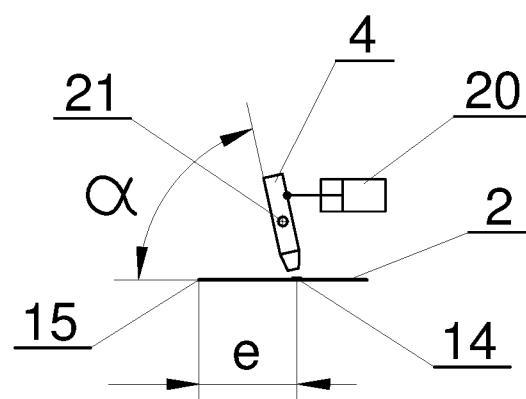


Fig. 1b

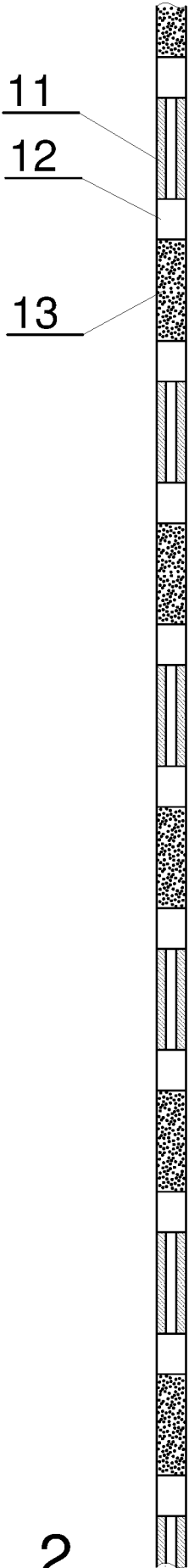


Fig. 2

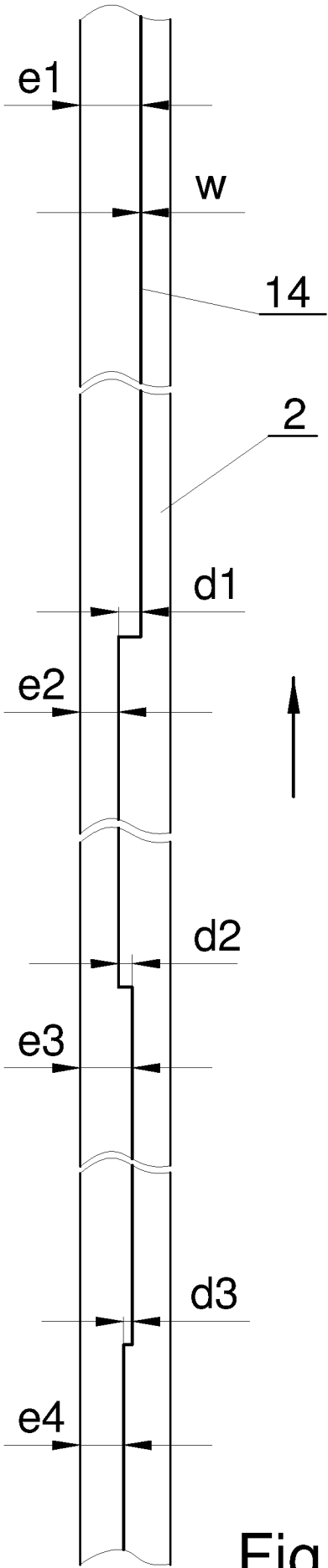


Fig. 3

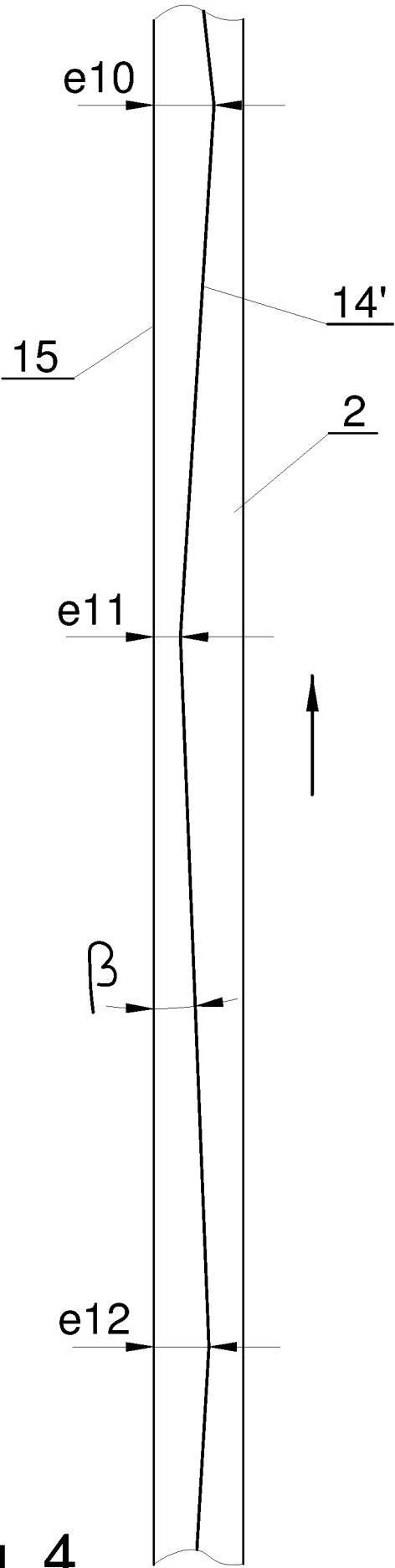


Fig. 4

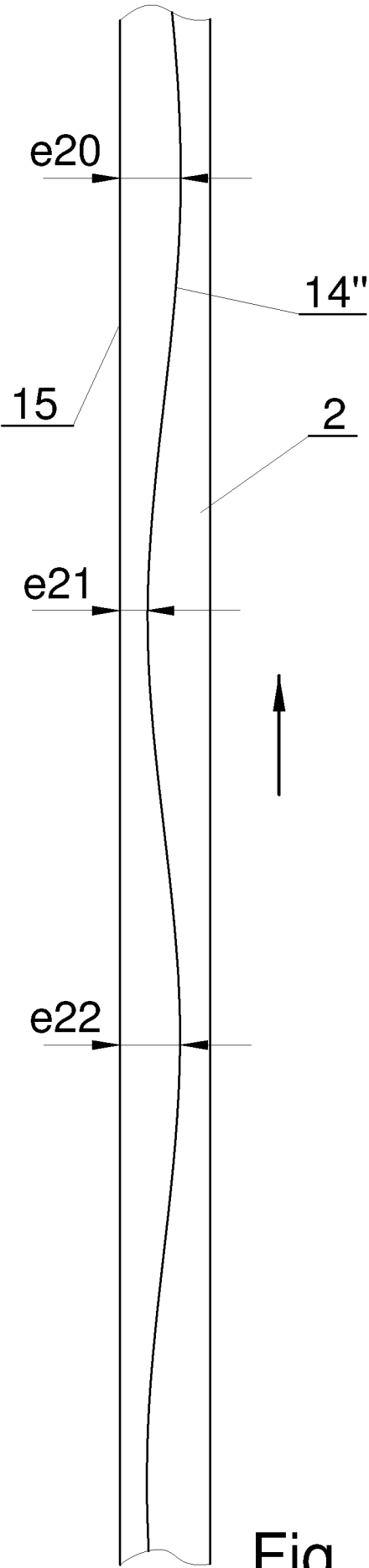


Fig. 5

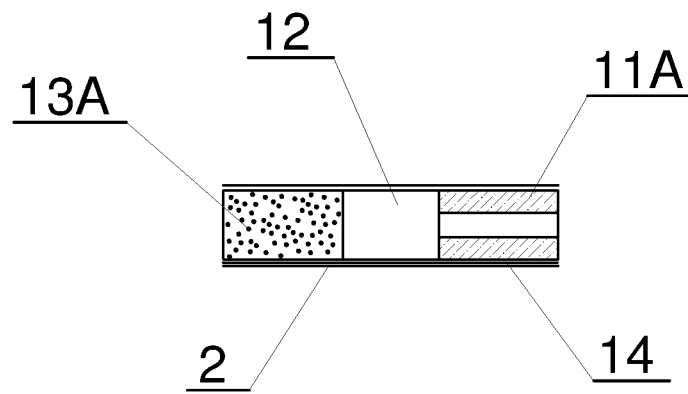


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2014/063574

A. CLASSIFICATION OF SUBJECT MATTER

INV. A24C5/24 A24D3/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24D A24C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 400 178 A1 (JAPAN TOBACCO INC [JP]) 24 March 2004 (2004-03-24) the whole document	1-6,9-12
A	----- WO 2013/022360 A2 (INT TOBACCO MACHINERY POLAND [PL]; SIKORA LESZEK [PL]; CIESLIKOWSKI BA) 14 February 2013 (2013-02-14) the whole document	1-13
A	----- EP 1 808 087 A1 (JAPAN TOBACCO INC [JP]) 18 July 2007 (2007-07-18) the whole document	1-13



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

14 January 2015

Date of mailing of the international search report

22/01/2015

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

MacCormick, Duncan

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2014/063574

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
EP 1400178	A1	24-03-2004	CN	1512846 A		14-07-2004
			EP	1400178 A1		24-03-2004
			JP	4026768 B2		26-12-2007
			US	2004124285 A1		01-07-2004
			WO	02100196 A1		19-12-2002

WO 2013022360	A2	14-02-2013	CN	103732088 A		16-04-2014
			EP	2741624 A2		18-06-2014
			JP	2014526888 A		09-10-2014
			US	2014174889 A1		26-06-2014
			WO	2013022360 A2		14-02-2013

EP 1808087	A1	18-07-2007	CA	2584759 A1		04-05-2006
			CN	101048083 A		03-10-2007
			EP	1808087 A1		18-07-2007
			ES	2399411 T3		01-04-2013
			HK	1104769 A1		15-01-2010
			JP	4454035 B2		21-04-2010
			KR	20070054249 A		28-05-2007
			RU	2345686 C1		10-02-2009
			UA	88657 C2		10-11-2009
			US	2007193593 A1		23-08-2007
			WO	2006046422 A1		04-05-2006
