



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
04.04.2007 Bulletin 2007/14

(51) Int Cl.:
D21G 9/00 (2006.01)

(21) Application number: **06121129.8**

(22) Date of filing: **22.09.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(71) Applicant: **Oradoc S.r.l.**
28024 Gargallo NO (IT)

(72) Inventor: **Pagani, Piero**
28012 Cressa (Novara) (IT)

(74) Representative: **Coppo, Alessandro et al**
Ing. Barzanò & Zanardo Milano S.p.A.,
Via Borgonuovo, 10
20121 Milano (IT)

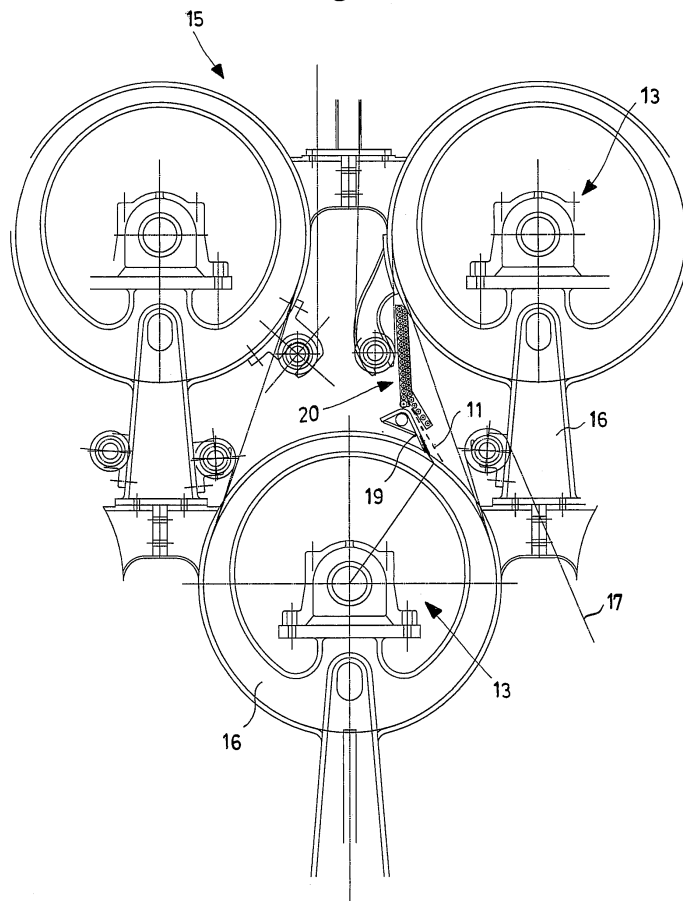
(30) Priority: **29.09.2005 IT MI20051824**

(54) **A device for leading and drawing a tail-end of paper**

(57) A drawing-in device (20) suitable for leading and drawing a tail-end of paper (11) leaving a roll (13) of a

continuous machine (10) for paper (12) comprises a series of rolls (21) facing each other and distanced so as to create a corridor in which the tail-end (11) is guided.

Fig. 2



Description

[0001] The present invention relates to a drawing-in device for tail-ends of paper.

[0002] In particular, the invention relates to a drawing-in device for tail-ends of paper translated into a dry end of a continuous machine.

[0003] In the production of paper, continuous machines are adopted, having the function of effecting, through a continuous series of operations, the transformation of the paste into a strip of paper wound onto a spool.

[0004] Among the synchronized mechanical organs forming the continuous machine, there is generally a *dry end* comprising one or more series of drying cylinders arranged on two offset rows and suitable for allowing the passage of the continuous sheet or strip of paper being dried, alternatively, above an upper cylinder and under a lower cylinder, at times adhering thereto by means of so-called felts, i.e. rings of fabric which accompany the translation of the strip along the section of drying cylinder, rotating around felt-tensioner cylinders in synchronism with the drying cylinders.

[0005] The continuous strip or sheet of paper being dried must therefore follow a straight connecting trajectory from one drying cylinder to another without being supported or accompanied by felts, as the latter are situated in an upper ring destined for the upper drying cylinders and a lower ring destined for the lower drying cylinders.

[0006] In the above straight empty spaces the continuous strip of paper follows its run thanks to continuity with the sections preceding it.

[0007] Problems arise when the machine is activated or when the strip of paper breaks.

[0008] In these cases, a new strip of paper must be formed which must begin its passage through the organs of the continuous machine until it reaches the reel (or coiling device) to form the spool.

[0009] One of the techniques currently used, even if it is rather outdated, envisages the manual twisting of the so-called initial tail-end around one or more ropes running along a side end of the cylinders of each section of the continuous machine.

[0010] In this way, a transportation of the initial portion or tail-end of the strip in formation is effected, which is then eliminated by the ropes when the strip is extended to its final transversal dimensions and begins to pass through the machine for its whole width.

[0011] This entraining system, however, is dangerous as the operator is compelled to wind the tail-end of the strip with his hands between moving organs, and safety regulations currently in force prohibit this type of operation.

[0012] During this "transitory" phase, the machine must also operate very slowly producing production losses; there are high risks, moreover, of breakage of the tail-end and paper-jamming is frequent.

[0013] In order to avoid the above drawbacks, automated devices have been proposed for guiding the tail-end of the strip through the empty spaces present between the rolls.

5 **[0014]** One of these devices is described in international patent application WO 03/018909 filed by Metso.

[0015] The device according to patent application WO 03/018909 comprises a strip, permeable to air, ring wound around rotation rolls. Inside the ring there is at least one strip suitable for creating a empty space in the portion of ring strip suitable for transporting the tail-end of the continuous sheet by the effect of the empty space created in the device.

10 **[0016]** The above device according to international patent application WO 03/018909, however, is complicated with respect to both its construction and activation and regulation.

[0017] A first objective of the present invention is therefore to provide a device which is simple to produce and operate, suitable for automatically leading the tail-end of the strip between the drying rolls of a continuous machine.

[0018] Also included in the objectives of the present invention is that of providing a device capable of directing the tail-end of any type of paper being processed.

[0019] These and other objectives according to the present invention are achieved by a drawing-in device for tail-ends of strips of paper according to what is specified in claim 1.

20 **[0020]** Further characteristics of the invention are object of the dependent claims.

[0021] The drawing-in device according to the present invention is suitable for leading and drawing a tail-end of paper leaving a roll of a continuous paper machine and comprises a series of rolls facing each other and distanced so as to create a corridor in which the tail-end is guided.

30 **[0022]** The characteristics and advantages of a drawing-in device for tail-ends of strips of paper, according to the present invention, will appear more evident from the following illustrative and non-limiting description, referring to the enclosed schematic drawings, in which:

figure 1 is a schematic perspective view of the dry end of a continuous paper machine;

figure 2 is a schematic side view of a portion of the dry end of figure 1, equipped with the device according to the invention;

figure 3 is a detail of figure 1 illustrating the device according to the invention from the side;

figure 4 is a section according to the line IV-IV of the device of figure 3.

40 **[0023]** With reference to the figures, these schematize a drawing-in device 20 for tail-ends 11 of strips of paper 12 which can be applied to a drying cylinder 13 of a set of cylinders, preferably but not exclusively drying cylinders belonging to a dry end 15 of a continuous paper

machine 10.

[0024] In particular, the drawing-in device 20 according to the present invention is destined for being firmly fixed to the shoulder 16 of the dry end close to the side end of a drying cylinder 13 for leading and drawing a tail-end 11, tail-end referring to the portion of paper which is passed through the cylinders of the machine which brings it to be wound around the reel.

[0025] The paper 12 being produced enters the dry end and can be adhered onto each cylinder by means of strips of fabric 17 which, as a result of articulated paths, are wound along the lower portion of the lower cylinders and along the upper portion of the upper cylinders of the series of cylinders of the dry end.

[0026] The drawing-in device 20 is therefore situated in the passage area between one cylinder and the next, possibly preceded by a removal device 19 such as a scraping knife which can be equipped with a jet of air suitable for detaching the arriving tail-end 11 and removing it from the cylinder 13.

[0027] The drawing-in device 20 according to the present invention comprises a series of rolls 21 facing each other and distanced so as to create a corridor in which the tail-end 11 is guided.

[0028] The rolls 21 are preferably assembled idle and offset on a framework 22 and are effected in two rows of facing rolls so as to engage both longitudinal edges 11' and 11" of the tail-end 11.

[0029] The framework 22 therefore has a "U"-section defined by a base 23 and two parallel flaps 24 from which pins 25 on which the rolls 21 are rotatably assembled, protrude inwards.

[0030] Said flaps 24 can also be folded back at the top by means of portions 24' in order to keep the tail-end housed during its run inside the device.

[0031] For certain applications with light or fragile paper, the motorization of at least one of said rolls can also be conveniently envisaged, with driving by transmissions of the other rolls so that the device is active in transporting the tail-end 11 instead of leaving the rolls with the sole function of guiding and conveying.

[0032] The drawing-in device advantageously envisages an entrance portion 26 inclined with respect to the moving direction of the tail-end in order to facilitate its insertion into the device immediately following the detachment of the tail-end itself from the roll, optionally effected by the removal device 19.

Claims

1. A drawing-in device (20) suitable for leading and drawing a tail-end (11) of paper leaving a roll (13) of a continuous machine (10) for paper (12), **characterized in that** it comprises a series of rolls (21) facing each other and distanced so as to create a corridor in which the tail-end (11) is guided.

2. The drawing-in device (20) according to claim 1, wherein said rolls (21) are assembled offset on a framework (22).

3. The drawing-in device (20) according to claim 1, wherein said rolls (21) are assembled on two parallel rows so as to engage both longitudinal edges (11' and 11") of the tail-end (11).

4. The drawing-in device (20) according to claim 1, wherein said rolls (21) are rotatably assembled idle on pins (25).

5. The drawing-in device (20) according to claim 1, wherein at least one of said rolls (21) is motorized and drives the remaining rolls by means of suitable transmissions.

6. The drawing-in device (20) according to claim 1, wherein said framework (22) has a "U"-section defined by a base (23) and two parallel flaps (24) from which pins (25) on which the rolls (21) are rotatably assembled, protrude inwards.

7. The drawing-in device (20) according to claim 1, wherein said drawing-in device comprises an entrance portion (26) inclined with respect to the moving direction of the tail-end (11) in order to facilitate its insertion into the drawing-in device.

8. A continuous paper machine **characterized in that** it comprises at least a drawing-in device according to any of the previous claims.

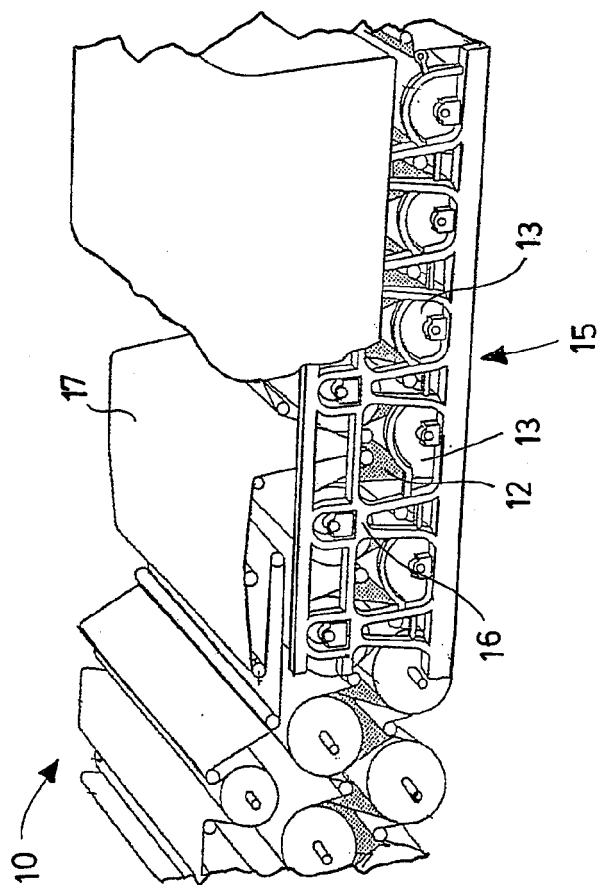


Fig. 1

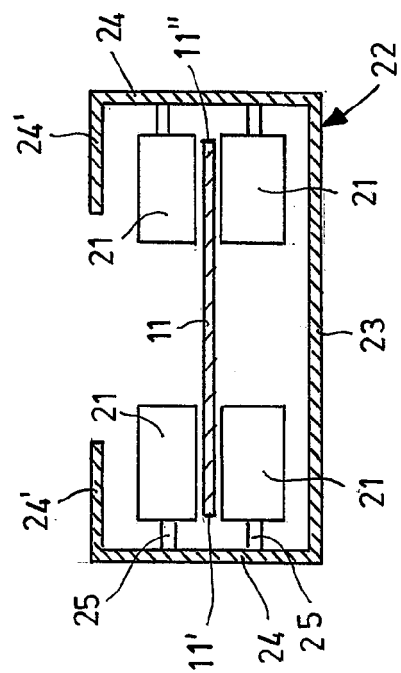


Fig. 4

Fig. 2

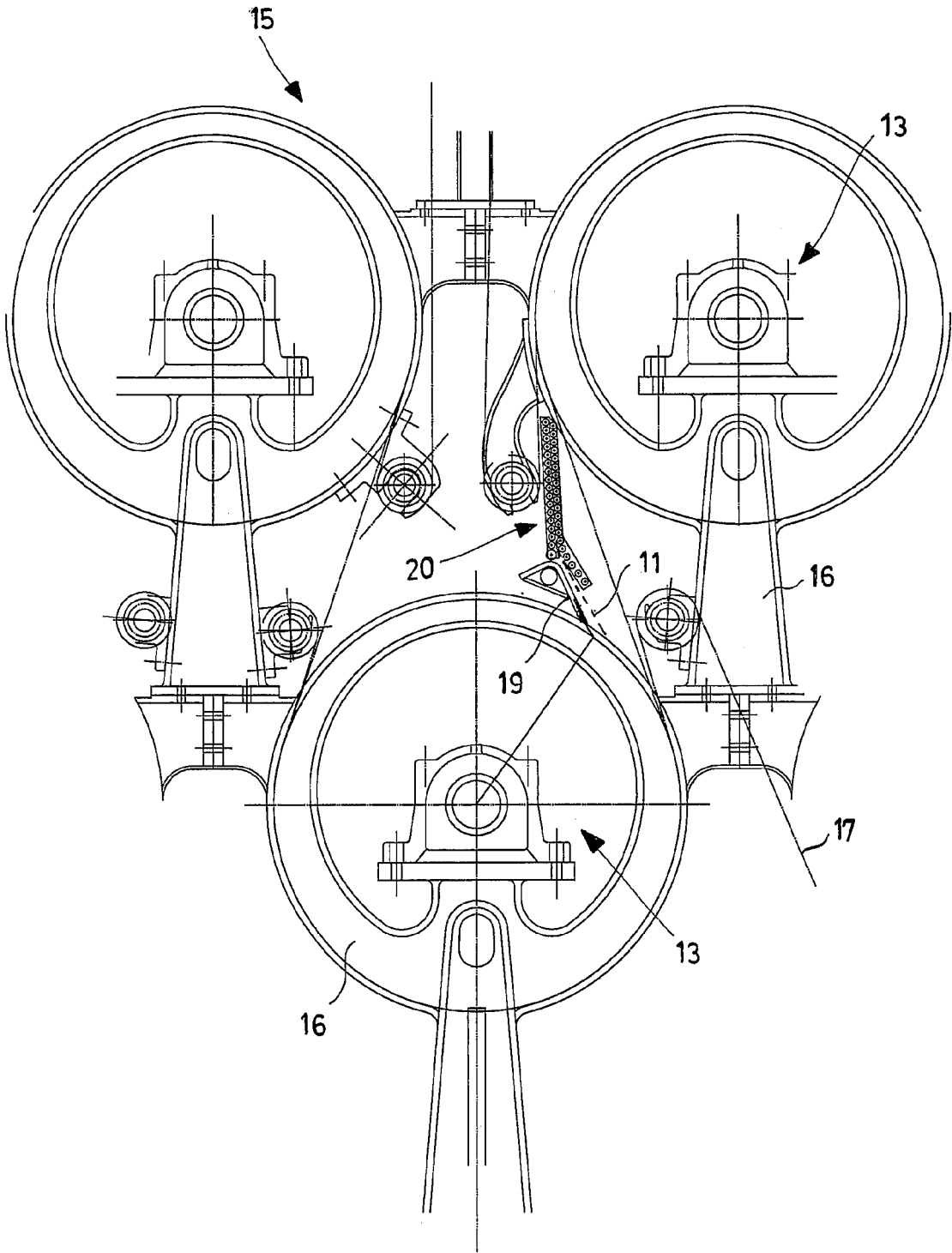
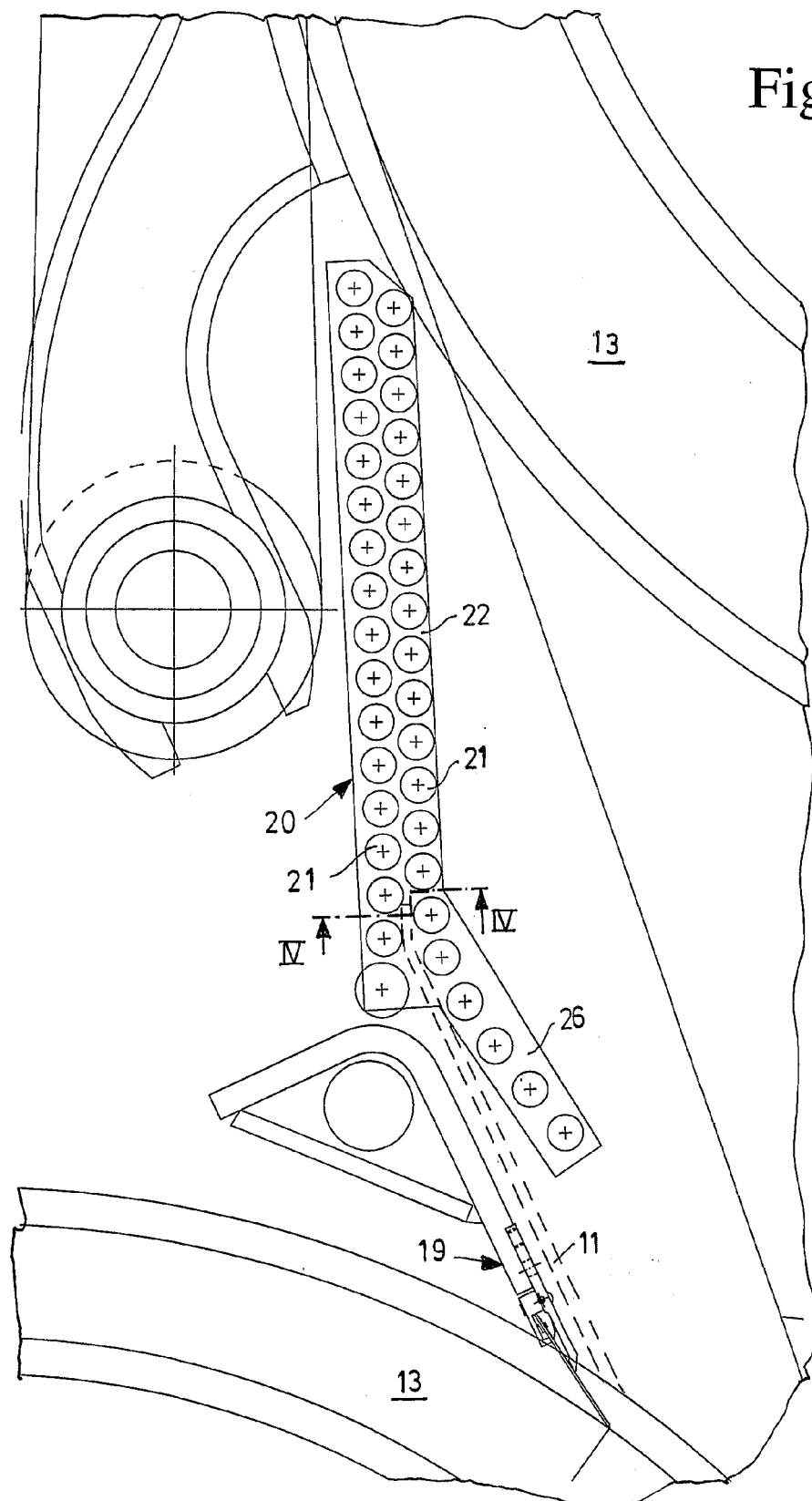


Fig. 3





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 12 1129

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
D,A	WO 03/018909 A (METSO PAPER INC [FI]; AHVENAINEN PASI [FI]; KOLJONEN VELI-PEKKA [FI];) 6 March 2003 (2003-03-06) * the whole document * -----	1	INV. D21G9/00
			TECHNICAL FIELDS SEARCHED (IPC)
			D21G D21F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 November 2006	Examiner Helpiö, Tomi
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

2
EPO FORM 1503 (03.02 (P04C01))

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03018909 A	06-03-2003	AT 343016 T	15-11-2006
		CA 2458036 A1	06-03-2003
		EP 1427884 A1	16-06-2004
		FI 20015023 A	23-02-2003
		US 2004244217 A1	09-12-2004

EPO FORM P0459

8

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 03018909 A [0014] [0015] [0016]