



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**14.05.2008 Bulletin 2008/20**

(51) Int Cl.:  
**A47K 10/16** <sup>(2006.01)</sup> **B65H 75/10** <sup>(2006.01)</sup>

(21) Application number: **07021613.0**

(22) Date of filing: **07.10.2007**

(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 MT NL PL PT RO SE SI SK TR**  
Designated Extension States:  
**AL BA HR MK RS**

(72) Inventor: **Pasquini, Sandro**  
**55100 Lucca (IT)**

(74) Representative: **Brogi, Graziano**  
**APTA S.R.L.**  
**Consulenti in Proprietà Industriale**  
**Via Giardini, 625**  
**41100 Modena (IT)**

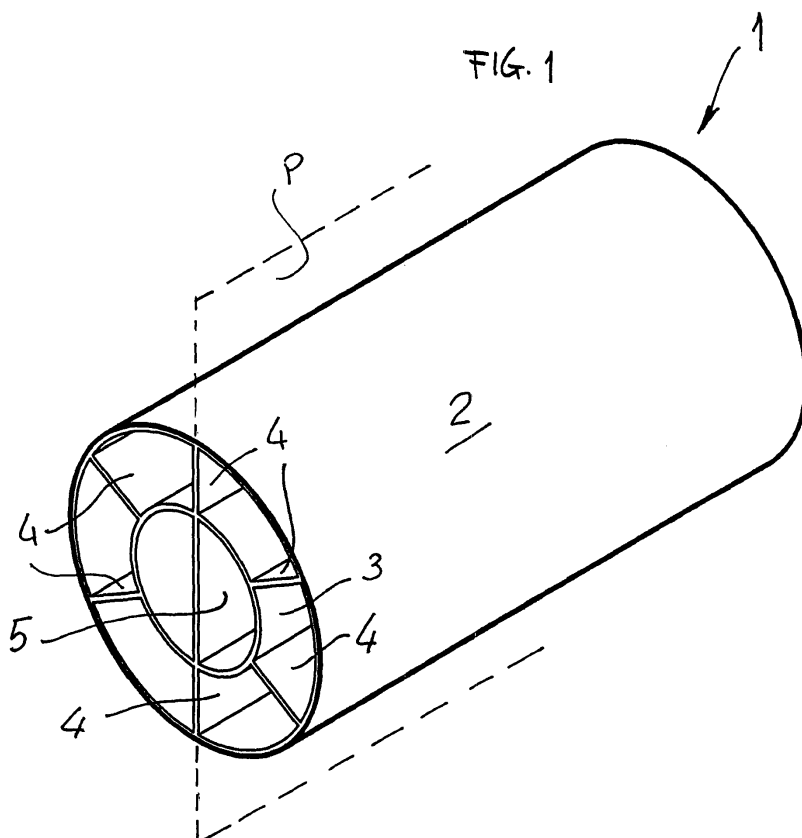
(30) Priority: **09.11.2006 IT MO20060023**

(71) Applicant: **Cartiera Lucchese S.p.A.**  
**55016 Porcari LU (IT)**

(54) **Core for rolls**

(57) The core for rolls of rollable and unrollable material comprises: first outer tubular means (2; 200) and second inner tubular means (3; 300), concentric with said first outer tubular means (2; 200); first connection ribs (4)

placed in between said first outer tubular means (2; 200) and second inner tubular means (3; 300), said second inner tubular means (3; 300) having at least one second inner diametral rib (5; 500).



## Description

**[0001]** The invention refers to a core for rolls of rollable and unrollable material.

**[0002]** It is well known that the rolls of rolled and unrollable materials for use, such as, e.g., rolls of kitchen paper or rolls of toilet paper, have a central portion, called core, that is made up of a segment of cylindrical tube made of various materials, such as cardboard or plastic.

**[0003]** This core is meant to act both as a support for the spirals of material, normally paper material, rolled to form the roll and as an element that can be coupled at the ends to a dispenser apparatus, so as to allow the roll to turn when a traction is applied at the free end of the rolled material to unroll a section of the latter.

**[0004]** This core must have a certain number of characteristics.

**[0005]** A first characteristic is the mechanical resistance to crushing and bending in transversal direction to the longitudinal axis of the core, to prevent, in case of crushing, because the diameter of the transversal section of the core is reduced, the spirals forming the roll from disuniting and slipping the one on the other due to a lack of the radial compression force which is generated between the spirals during the rolling of the material to form the roll.

**[0006]** In this case, if the roll of rollable material is fitted in a dispensing device that requires the material to pass through a thin dispenser opening, the operation of this dispensing device can be stopped.

**[0007]** A second characteristic which the cores for rolls must have is a very low cost, because these are "disposable" material, meaning intended to be thrown away after the roll of rolled material is finished: for this reason, the cores are made from low-cost materials, such as cardboard or plastic, keeping thicknesses as thin as possible.

**[0008]** To prevent transversal yielding, despite the considerable reduction of thicknesses, cores are currently made that comprise a pair of concentric tubular bodies that are joined together by a series of transversal stiffening ribs which develop between the outer surface of the inner tubular body and the inner surface of the outer tubular body.

**[0009]** A core of this type is described in the Italian patent for Utility Model no. 246.741 registered on 19.05.1999 in the name of the applicant.

**[0010]** This core, though having a high mechanical resistance in a transversal direction, does however have a number of drawbacks.

**[0011]** A first drawback is the possibility that in certain conditions of use, the joining ribs between the outer tubular body and the inner tubular body bend, causing the outer tubular body to fold in on the inner one.

**[0012]** If, at the same time as this bending, an intense traction is applied to the rolled material, the inner tubular body, which is the only one to provide mechanical resistance in a transversal direction, also bends and inside the core the drawbacks again occur relating to the decom-

position of the spirals of material of the roll affecting known cores made up of simple tubular bodies.

**[0013]** Furthermore, if the roll is fitted in a dispensing device, the ends of the core come away from the sustaining supports and the roll falls from the dispensing position blocking the latter and requiring the intervention of a maintenance operator to restore the operation of the dispensing device.

**[0014]** This bending of the stiffening ribs can occur by applying a twisting force between the outer and inner tubular bodies.

**[0015]** This twisting force is generated when together with the application of an excessive force of traction on the rolled material, which is transmitted on the outer tubular body, the inner tubular body is prevented or hindered in its free rotation on the supports intended to sustain it.

**[0016]** This possibility of rib bending increases in the cores made of cardboard and whenever the rolls of rolled material are positioned for use in very damp environments; the humidity is absorbed by the core which is therefore mechanically weakened.

**[0017]** Plastic cores also have the same problem, when the ribs and the concentric tubular bodies have very limited thicknesses to cut the production costs determined by the material.

**[0018]** A second drawback of the known cores is that they permit making rolls that have a limited number of spirals of rolled material, because of the limited thicknesses of the materials, and therefore, as has been said, of their low mechanical resistance, and of the overall transversal dimensions the known cores must have to be able in any case to mechanically resist deformations and to sustain, without problems, a limited and predetermined number of spirals.

**[0019]** One object of the invention is to improve the prior art.

**[0020]** Another object of the invention is to make a core for rolls of rollable material that has a mechanical resistance to the transversal deformation considerably greater than that of known cores and which maintains the possibility of unrolling the rolled material substantially intact.

**[0021]** A further object of the invention is to make a core for rolls of rollable material that allows rolling a greater number of spirals of material than that currently possible.

**[0022]** According to an aspect of the invention, a core is provided for rolls of rollable and unrollable material, comprising: first outer tubular means and second inner tubular means, concentric with said first tubular means; first connection ribs placed in between said first outer tubular means and second inner tubular means, characterized in that said second tubular means have at least one second inner diametral rib.

**[0023]** The core for rolls of rollable and unrollable material permits avoiding crushing in directions transversal to the longitudinal axis and, consequently, the blockage of the rotation of rolls on the supports intended to sustain

the core.

**[0024]** The core for rolls further permits being made with inexpensive materials that have very limited thicknesses.

**[0025]** Further characteristics and advantages of the invention will appear more evident from the description of an embodiment of a core for rolls of rollable and unrollable material, illustrated indicatively by way of non limiting example, in the attached drawings wherein:

Figure 1 is a perspective view of a first embodiment of a core for rolls of rollable and unrollable material; Figure 2 is a front view of the core of Figure 1; Figure 3 is a perspective view of a second embodiment of a core for rolls of rollable and unrollable material; Figure 4 is a front view of the core of Figure 3; Figure 5 is a perspective view of a third embodiment of a core for rolls of rollable and unrollable material; Figure 6 is a front view of the core of Figure 5.

**[0026]** With reference to the Figures, it will be noticed that the core 1 for rolls of rollable and unrollable material comprises a first outer tubular body 2 and a second inner tubular body 3, coaxial with the first outer tubular body 2.

**[0027]** Normally, the latter has a cylindrical shape and a round cross section, while the second inner tubular body 3 can also have a round cross section, as shown in Figure 2, or a polygonal cross section, as shown in Figures from 3 to 6, in which the cross section of the second inner tubular body unit 3 is, by way of example, quadrangular and, more specifically, square, without however ruling out the possibility that this section can have the perimeter of other polygons with several sides.

**[0028]** Between the first outer body 2 and the second inner body 3, connection ribs 4 are provided, all radially directed and opposite two by two, so as to define a position plane "P" between each pair of opposite ribs 4.

**[0029]** According to a first embodiment of the core 1 for rolls of rollable and unrollable material, shown in the Figures 1 and 2, between the two ribs 4 a second rib 5 is arranged diametrically inside the second tubular body 3, which, in point of fact, represents a second rib 5 joining two opposite ribs 4 lying on the same position plane "P".

**[0030]** According to another embodiment of a core for rolls of rollable and unrollable material shown in Figures 3 and 4 and indicated by 100 to distinguish it from the previous core 1, this again comprises a first outer tubular body 200 and a second concentric inner tubular body 300, which has a square cross section and which is connected to the first outer tubular body 200 by means of radially directed first ribs 400.

**[0031]** In this second embodiment as well, the second inner tubular body 300 internally has at least one second rib 500 that joins two alternate vertices and two first ribs 400 opposite one another and which are on a common position plane "P".

**[0032]** In the further embodiment of the core for rolls

of rollable and unrollable material, indicated by 600, it will be noticed that this is substantially the same as the embodiment shown in Figures 3 and 4, but has a third rib 700 that perpendicularly intersects the second rib 400 and which, practically, joins the other two first ribs 400 which, in the embodiment illustrated in the Figures 3 and 4 lie on a common position plane "P", but are separated from each other.

**[0033]** The core for rolls of rollable and unrollable material therefore has one or more second and third ribs, 400 and 700 respectively, that stiffen the pairs of first ribs 4 and 400 in a longitudinal direction and both the second inner tubular body 3, or 300, and the first outer tubular body 2, or 200, in a transversal direction, both preventing the bending of one with respect to the other, and that crushing occurs in a transversal direction such as to break up the roll formed on the first outer tubular body.

**[0034]** This mechanical resistance in transversal direction of the outer tubular body 2, or 200, and of the inner tubular body 3, or 300, also allows increasing the number of spirals of rollable and unrollable material and reducing the thicknesses of the materials used to make the core for rolls.

**[0035]** The ends of the latter can be coupled with rotating bilateral supports, e.g. of dispensing devices, ready to be coupled in a conjugated way with the second and third ribs 5, 500 and 700, having, e.g., pre-made cuts to receive the latter.

## Claims

1. Core for rolls of rollable and unrollable material, comprising: first outer tubular means (2; 200) and second inner tubular means (3; 300), concentric with said first outer tubular means (2; 200); first connection ribs (4) placed in between said first outer tubular means (2; 200) and second inner tubular means (3; 300), **characterized in that** said second inner tubular means (3; 300) have at least one second inner diametral rib (5; 500).
2. Core according to claim 1, wherein said at least one second inner diametral rib (5; 500) lies on a position plane (P) defined by two first opposite connection ribs (4).
3. Core according to claim 1, wherein said at least one second inner diametral rib (5; 500) is straight.
4. Core according to any of the claims from 1 to 3, wherein said at least one second inner diametral rib (5; 500) is aligned to said two first opposite connection ribs (4).
5. Core according to any of the claims from 1 to 4, wherein said second inner tubular means (3; 300) have further inner diametral ribs (700) which inter-

sect along a longitudinal axis of said second inner tubular means (3; 300) said at least one second inner diametral rib (5; 500).

6. Core according to claim 5, wherein said at least one second inner diametral rib (5; 500) is aligned to respective pairs of first opposite ribs (4). 5
7. Core according to any of the claims from 1 to 6, wherein said first outer tubular means (2; 200) have round cross section. 10
8. Core according to any of the claims from 1 to 6, wherein said first outer tubular means (2; 200) have polygonal cross section. 15
9. Core according to any of the claims from 1 to 6, wherein said second inner tubular means (3; 300) have round cross section. 20
10. Core according to any of the claims from 1 to 6, wherein said second inner tubular means (3; 300) have polygonal cross section.
11. Core according to any of the claims 1 or 10, wherein said first ribs (4) extend radially from vertices of said polygonal section of said second inner tubular means (3; 300). 25
12. Core according to any of the claims 1, 8, 10, 11, wherein said first ribs (4) join the vertices of said polygonal section of said first outer tubular means (2; 200) and of said second inner tubular means (3; 300). 30

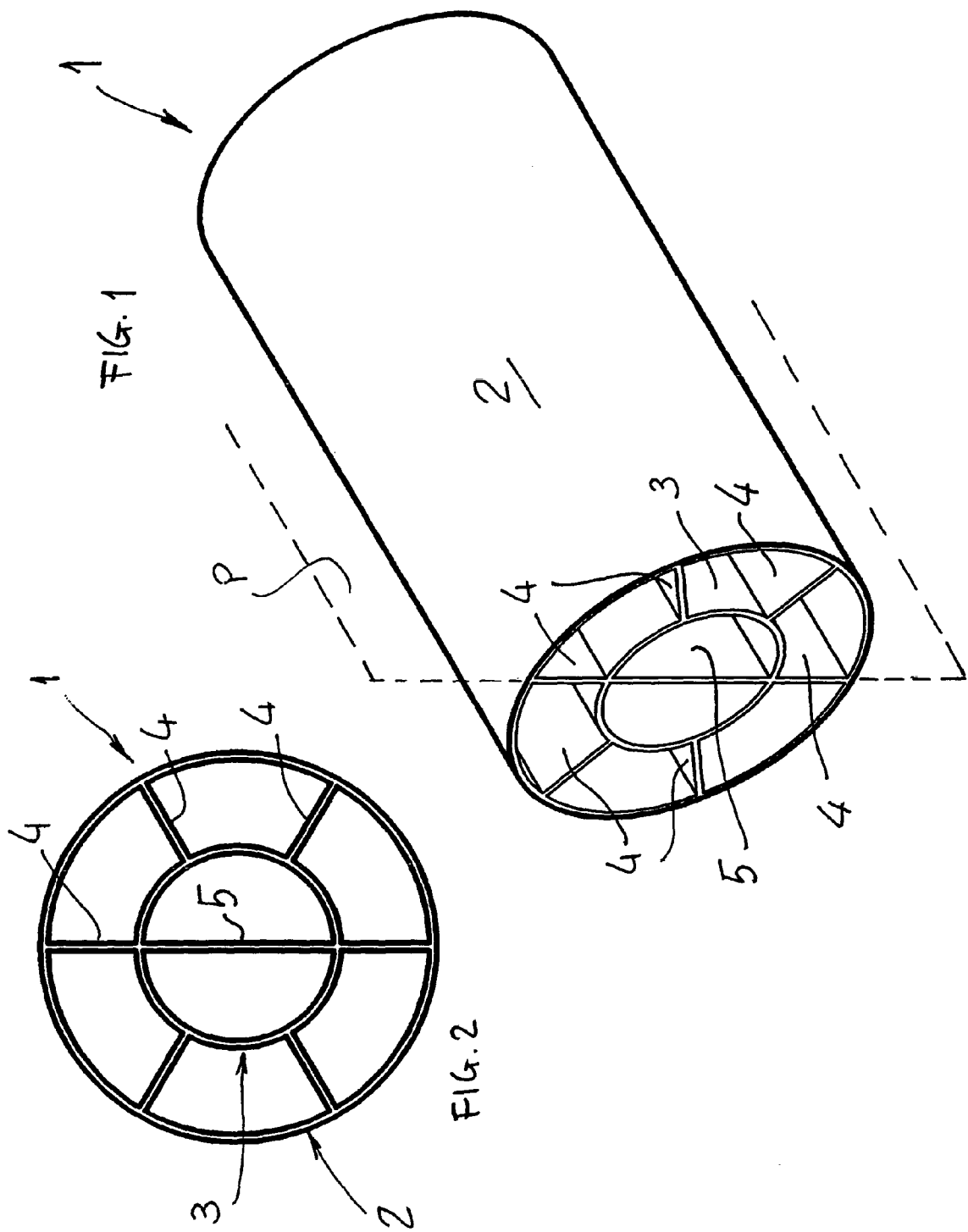
35

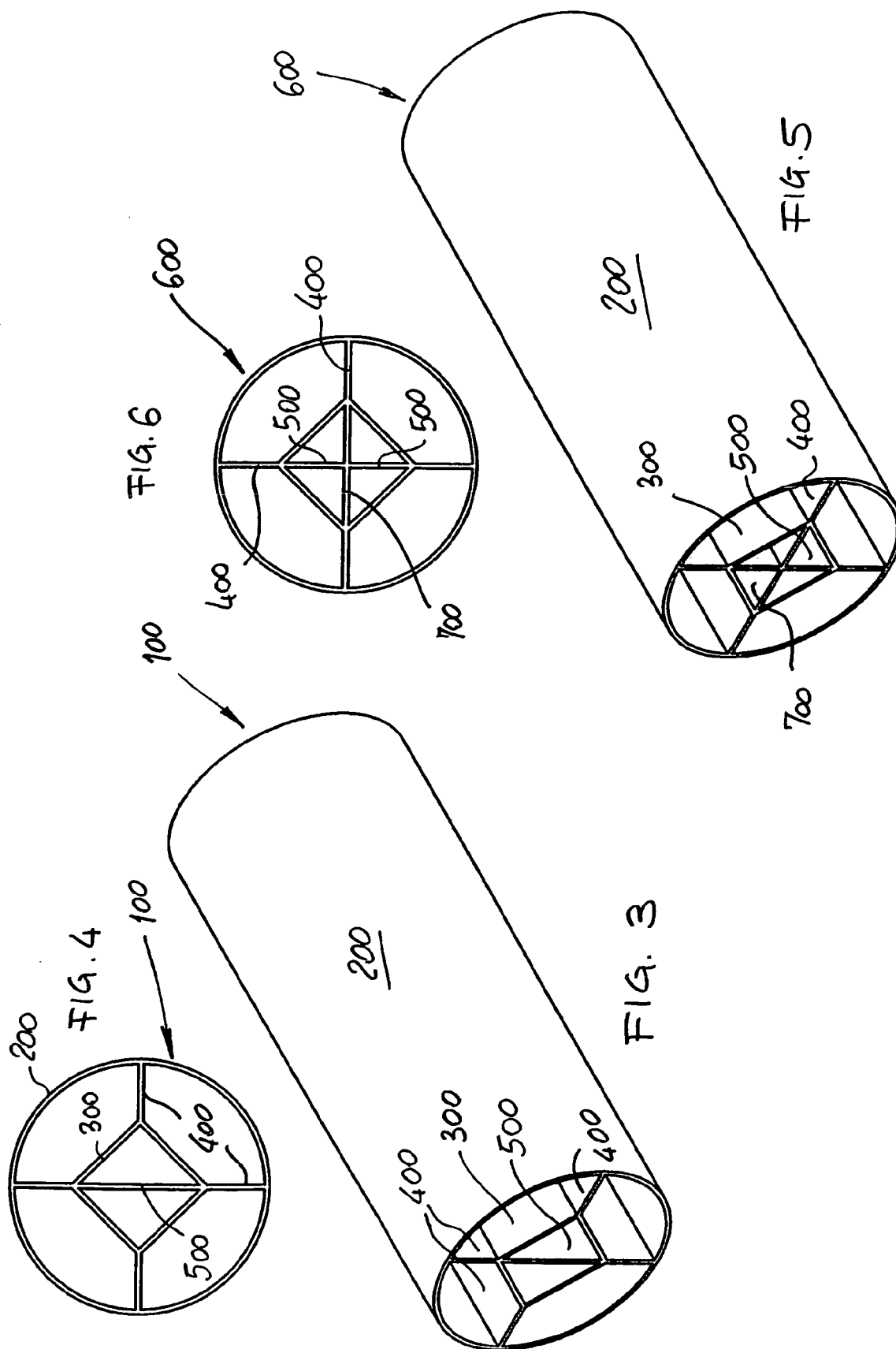
40

45

50

55





**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**

- IT 246741 [0009]