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(71) Applicant: **Nespoli Engineering KKFT
H-1031 Budapest (HU)**

(72) Inventor: **NESPOLI, Alessandro
23896, SIRTORI (Lecco) (IT)**

(74) Representative: **Ripamonti, Enrico
Giambrocono & C. s.p.a.
Via Rosolino Pilo 19 B
I-20129 Milano (IT)**

(54) **Device for connecting a handle to a painting roller**

(57) A device (1) for connecting a handle (4) to a painting roller (3) comprises a cylindrical element (2) which may be connected to the painting roller (3) and defining a chamber (7) into which a holding element (8)

is housed. When a bar of the handle (4) is inserted into said cylindrical element (2), the holding element (8) catches a portion of the bar of the handle (4) preventing its extraction from the cylindrical element (2). The holding element (8) is tubular in shape.

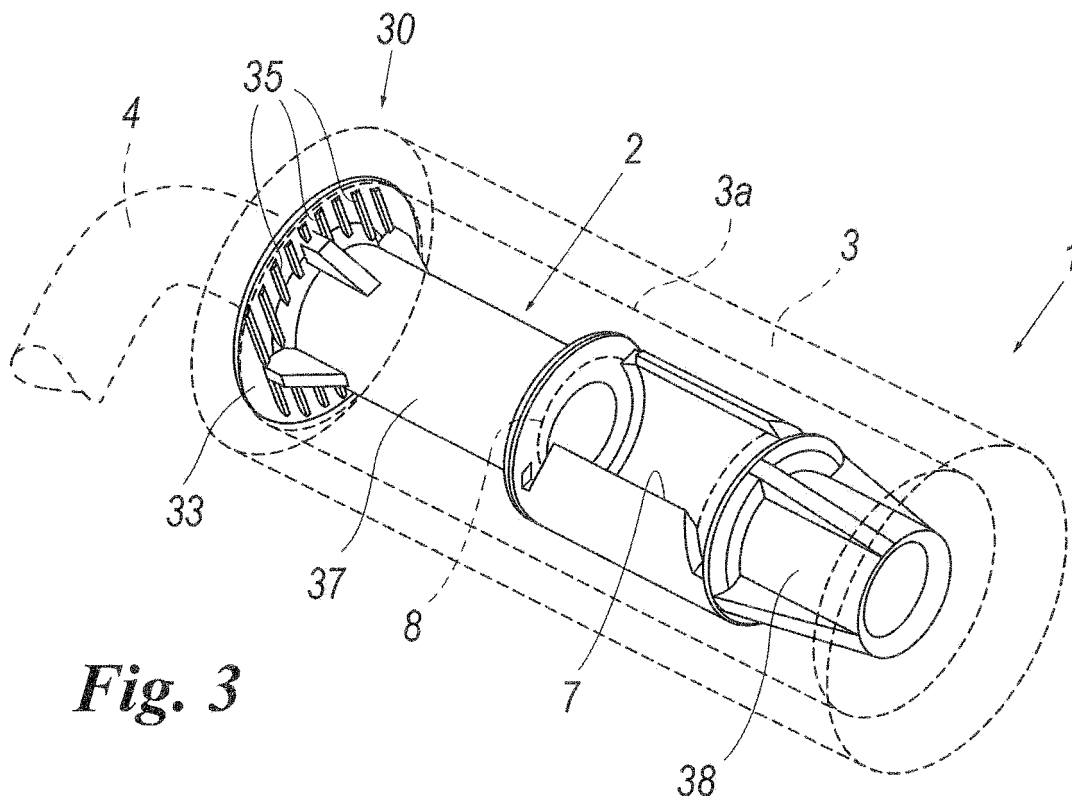


Fig. 3

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Description

[0001] The present invention relates to a device for connecting a handle to a painting roller.

[0002] Handles usually are provided with a grip and a metallic bar (typically made of steel or aluminium) or a plastic bar; this bar usually has a diameter of 4-10 millimetres and is connected to the painting roller.

[0003] In particular, the present invention relates to mini-rollers, i.e. painting rollers having one of their sides provided with an opening to receive an end of the bar, while the other side is closed.

[0004] These painting rollers have a cylindrical element provided with a chamber into which a C-shaped element for holding the bar is housed.

[0005] The cylindrical element further has transversal triangular ribs (or different ribs such as longitudinal straight ribs, circular ribs and the like) which extend from its outer surface such that, when the painting roller is inserted onto the cylindrical element, these triangular ribs mechanically hold the painting roller.

[0006] When the bar of the handle is inserted into the cylindrical element it is also inserted into the C-shaped holding element which expands; thus the bar of the handle is held by the holding element and at the same time is maintained within the cylindrical element.

[0007] Nevertheless, the traditional holding members have a number of drawbacks, in particular, in order to guarantee the mechanical strength, they must be manufactured with a great thickness.

[0008] In addition, manufacturing an open element (like the C-shaped holding element) is very difficult because after moulding, during cooling, the moulded element tends to shrink; thus the dimension of the slit of the C-shaped element may vary according to the particular manufacturing conditions and consequently, also the mechanical properties of the C-shaped element vary.

[0009] Therefore two C-shaped elements may have a central hole and a slit having different dimensions; consequently also the holding strength (due to the elastic force) varies.

[0010] Moreover, during operation the painting roller is usually dipped into the paint, before it is run onto a surface to be painted.

[0011] Nevertheless, paints often comprise solvents such as acetone or toluene.

[0012] These solvents (acetone or toluene or other solvents) soften the plastic material of the cylindrical elements; in particular the ribs of the cylindrical element soften and may not be able to withhold the painting roller; thus the cylindrical element may come out from the painting roller.

[0013] The technical aim of the present invention is therefore to provide a device for connecting a handle to a painting roller by which the said problems of the known art are eliminated.

[0014] Within the scope of this technical aim, an object of the invention is to provide a holding element which has

a small thickness when compared to a traditional holding element.

[0015] This allows plastic material and costs to be saved.

5 **[0016]** Another object of the invention is to provide a holding element which may be manufactured in a very easy way and, in particular, which has a structure that guarantees that when a number of holding elements are manufactured, they have substantially the same mechanical properties, independently of the particular manufacturing conditions.

10 **[0017]** A further object of the present invention is to provide a cylindrical element which is connected to the painting roller in a very reliable way, such that the risks of breakage due for example to the coming out of the cylindrical element from the painting roller is very limited and, in any case, not dependant from the presence of particular solvents within the paint.

15 **[0018]** The technical aim, together with these and further objects, are attained according to the invention by providing a device for connecting a handle to a painting roller in accordance with the accompanying claims.

20 **[0019]** Further characteristics and advantages of the invention will be more apparent from the description of a preferred but non-exclusive embodiment of the device for connecting a handle to a painting roller according to the invention, illustrated by way of non-limiting example in the accompanying drawings, in which:

30 Figure 1 is a top view of a holding element of the device according to the invention;
Figure 2 is a perspective view of the holding element of figure 1;
Figure 3 is a perspective view of a cylindrical element of the device of the invention; and
35 Figure 4 is an enlarged view of a portion of the cylindrical element of figure 3.

40 **[0020]** With reference the figures, these show a device for connecting a handle to a painting roller indicated overall by the numeral reference 1.

[0021] The device 1 comprises a cylindrical element 2 which may be connected to a painting roller 3; in this respect figure 3 shows a cylindrical element 2 in solid line and a painting roller 3 which is connectable to the cylindrical element in dashed line. In addition figure 3 also shows a rod-shaped end portion of the handle 4 in dashed line.

45 **[0022]** Painting rollers 3 are known to comprise a central tubular element 3a (into which the end of the bar is inserted) which carries a sponge or pilose fabric.

[0023] The cylindrical element 2 defines a chamber 7 into which a holding element 8 is housed.

50 **[0024]** Figure 3 also shows in dashed line the holding element 8 inserted into the chamber 7.

55 **[0025]** When the bar of the handle 4 is inserted into the cylindrical element 2, the holding element 8 catches the bar of the handle 4 preventing its extraction from the

cylindrical element 2.

[0026] In particular, the holding element 8 is tubular in shape.

[0027] As shown in the figures, the tubular holding element 8 has a stretched out central hole 10 arranged to receive the bar of the handle 4.

[0028] In particular, the tubular holding element 8 has two first opposite sector ring-shaped portions 12 having a first inner curvature radius 14, and further two second opposite sector ring-shaped portions 16 having a second inner curvature radius 18; the first inner curvature radius 14 is shorter than the second inner curvature radius 18.

[0029] Thus the tubular holding element 8 is substantially elliptical in shape; this structure allows the element 8 to have very high mechanical properties even if it has a small thickness.

[0030] The tubular holding element 8 is also provided with transversal ribs 22 extending radially within the central hole 10.

[0031] The ribs 22 extend only from said first opposite sector ring-shaped portions 12 of the tubular holding element 8, while they do not extend from the second opposite sector ring-shaped portions 16.

[0032] In a different embodiment, the ribs 22 may also extend at least partially from the second opposite sector ring-shaped portions 16 (thus in this embodiment the ribs extend from the first and the second portions 12, 16).

[0033] The second opposite portions 16 of the tubular element 8 have thickness greater than the thickness of the first opposite portions 12.

[0034] In addition, the tubular holding element 8 has one or both ends of the central hole 10 which is chamfered in order to help the bar of the handle 4 to be inserted into the hole 10 of the tubular holding element 8.

[0035] Figure 2 shows one end of the central hole 10 which is chamfered in 11.

[0036] The cylindrical element 2 has a side edge 30 from which a circular plate 33 extends.

[0037] This plate 33 is provided with a number of protrusions 35 arranged to be soldered by ultrasound to a side portion of the central tubular element 3a of the painting roller 3.

[0038] In this way the connection of the cylindrical element 2 to the painting roller 3 is very tight and the risks of breakage even when the painting roller is dipped into a paint containing solvents is very limited.

[0039] In the present embodiment the protrusions 35 comprise a number of parallel ribs; it is clear that any other adapted shape of the ribs may be used.

[0040] The cylindrical element 2 preferably comprises a first tubular portion 37 between the circular plate 33 and the chamber 7, and a second tubular portion 38 extending from the other side of the chamber 7.

[0041] Preferably, the cylindrical element 2, its circular plate 33 and the protrusions 35 are made of a plastic material which is the same plastic material of the central tubular element 3a of the painting roller 3; naturally also different material may be used, provided that they are

compatible, i.e. they allow the ultrasound soldering to be made. Preferably said material is polypropylene or Nylon.

[0042] The operation of the device for connecting a handle to a painting roller of the invention is apparent from that described and illustrated and is substantially the following.

[0043] During manufacturing, the tubular holding element 8 is inserted into the chamber 7 of the cylindrical element 2.

[0044] Afterwards the painting roller 3 is inserted on the cylindrical element 2; a side portion of the painting roller is placed against the plate 33 and the protrusions 35 are soldered to the painting roller by ultrasound.

[0045] After the painting roller has been assembled on the cylindrical element, the tubular holding element 8 may not exit the chamber anymore.

[0046] When the end of the bar 4 is inserted into the cylindrical element, it also passes through the tubular holding element 8.

[0047] The tubular holding element 8 receives the bar 4 in its hole 10.

[0048] Thus the tubular holding element 8 expands and withholds the bar 4 which may not accidentally exit the cylindrical element 2.

[0049] In addition, the device according to the invention may be provided with the tubular holding element 8 described in this document which is inserted into the chamber 7 of a traditional cylindrical element (i.e. provided with ribs), or the device may comprise a cylindrical element 2 according to this invention (i.e. with cylindrical element which is ultrasound soldered to the central tubular element of the painting roller) which carries a traditional tubular holding element.

[0050] It has been found in practice that the device according to the invention is particularly advantageous because the tubular holding element 4 has mechanical properties which are very high and almost the same for different pieces. In addition it is cheap and easy to be manufactured because it requires a smaller amount of plastic material when compared to the traditional holding element and the manufacturing process requires less cautions.

[0051] The device conceived in this manner is susceptible of numerous modifications and variants, all falling within the scope of the claims; moreover all details can be replaced by technically equivalent elements.

[0052] In practice the materials used and the dimensions can be chosen at will according to the requirements and to the state of the art.

Claims

1. Device (1) for connecting a handle (4) to a painting roller (3) comprising a cylindrical element (2) which may be connected to the painting roller (3) and defining a chamber (7) into which a holding element (8) is housed, such that when the bar of the handle (4)

is inserted into said cylindrical element (2), the holding element (8) catches a portion of said bar of said handle (4) preventing its extraction from the cylindrical element (2), **characterised in that** said holding element (8) is tubular in shape.

2. Device (1) as claimed in claim 1, **characterised in that** said tubular holding element (8) has a stretched out central hole (10) arranged to receive said bar of said handle (4). 10
3. Device (1) as claimed in claim 2, **characterised in that** said stretched out tubular holding element (8) has two first opposite sector ring-shaped portions (12) having a first inner curvature radius (14), and further two second opposite sector ring-shaped portions (16) having a second inner curvature radius (18), said first inner curvature radius (14) being shorter than the second inner curvature radius (18). 20
4. Device (1) as claimed in claim 3, **characterised in that** the tubular holding element (8) is substantially elliptical in shape.
5. Device (1) as claimed in claim 2, **characterised in that** said tubular holding element (8) is provided with transversal ribs (22) extending within said central hole (10), wherein said transversal ribs (22) extend radially. 25
6. Device (1) as claimed in claim 3, **characterised in that** said second opposite portions (16) of said tubular element (8) have a thickness greater than the thickness of the first opposite portions (12). 30
7. Device (1) as claimed in claim 2, **characterised in that** said tubular holding element (8) has at least one end of the central hole (10) which is chamfered (11) in order to help the bar of the handle (4) to be inserted into the hole (10) of said tubular holding element (8). 35
8. Device (1) as claimed in claim 1, **characterised in that** said cylindrical element (2) has a side edge (30) from which a plate (33) extends, wherein said plate (33) is provided with a number of protrusions (35) arranged to be soldered to a side portion of said painting roller (3) by ultrasound. 40
9. Device (1) as claimed in claim 8, **characterised in that** said protrusions (35) comprise a number of parallel ribs. 45
10. Device (1) as claimed in claim 8, **characterised in that** said cylindrical element (2) comprises a first tubular portion (37) between said plate (33) and said chamber (7), and a second tubular portion (38) extending from the other side of said chamber (7). 50

11. Device (1) as claimed in claim 8, **characterised in that** said cylindrical element (2), its circular plate (33) and the protrusions (35) are made of a plastic material which is the same plastic material of the central tubular element (3a) of the painting roller (3). 5

12. Device (1) as claimed in claim 8, **characterised in that** said cylindrical element (2), its circular plate (33) and the protrusions (35) are made of a plastic material which is different from and compatible with the material of the central tubular element (3a) of the painting roller (3). 10

13. Device (1) as claimed in claim 11 or 12, **characterised in that** said material is polypropylene or Nylon. 15

14. Device (1) for connecting a handle (4) to a painting roller (3) comprising a cylindrical element (2) which may be connected to the painting roller (3) and defining a chamber (7) into which a holding element (8) is housed, such that when a bar of the handle (4) is inserted into said cylindrical element (2), the holding element (8) catches a portion of said bar of the handle (4) preventing its extraction from the cylindrical element (2), **characterised in that** said cylindrical element (2) has a side edge (30) from which a plate (33) extends, wherein said plate (33) is provided with a number of protrusions (35) arranged to be soldered to a side portion of said painting roller (3) by ultrasound. 20

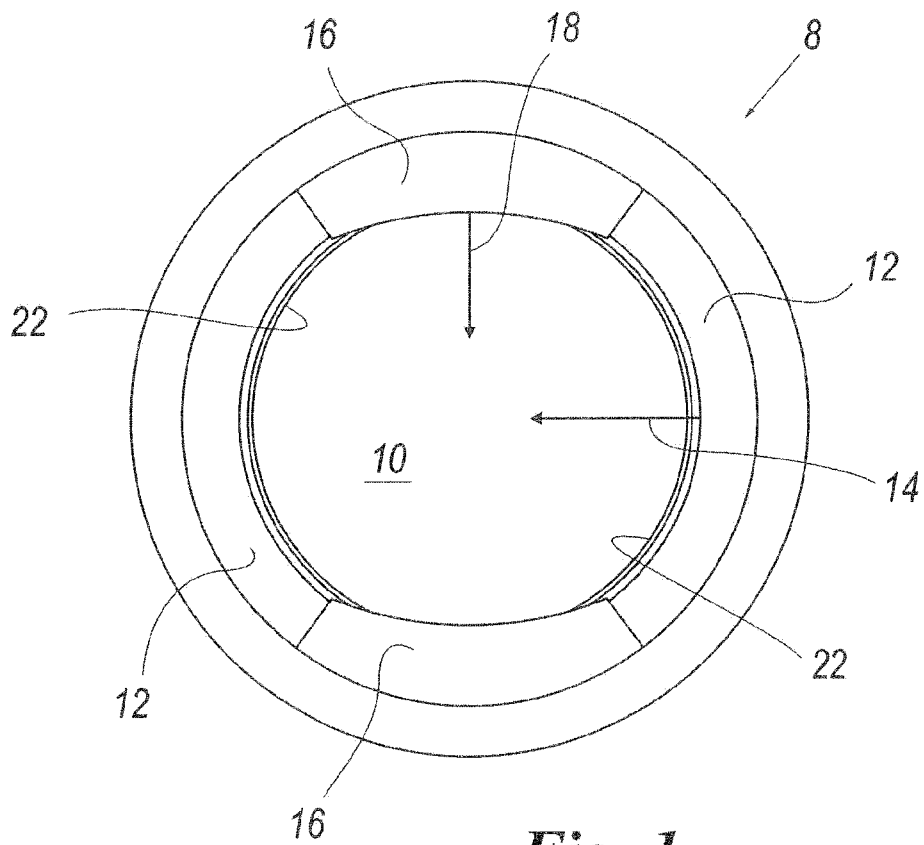


Fig. 1

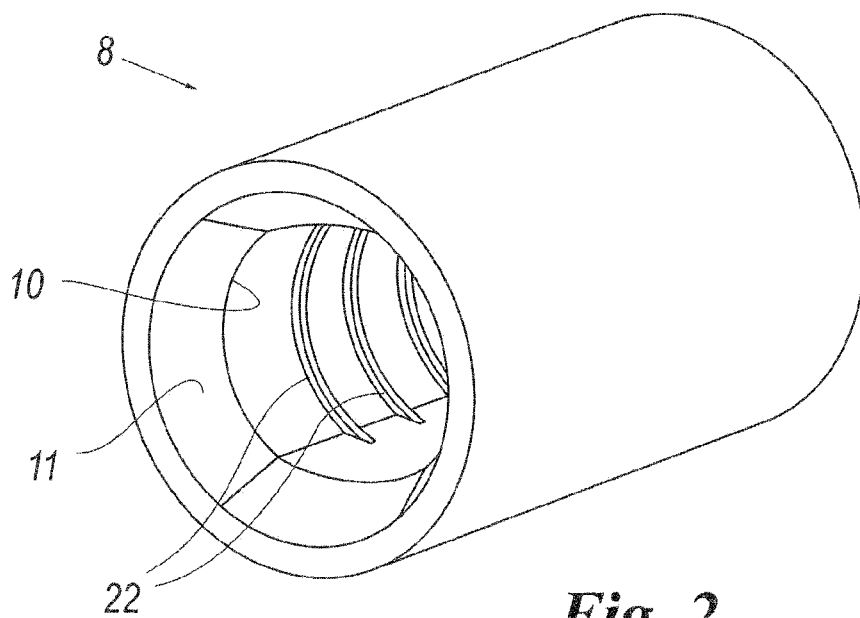


Fig. 2

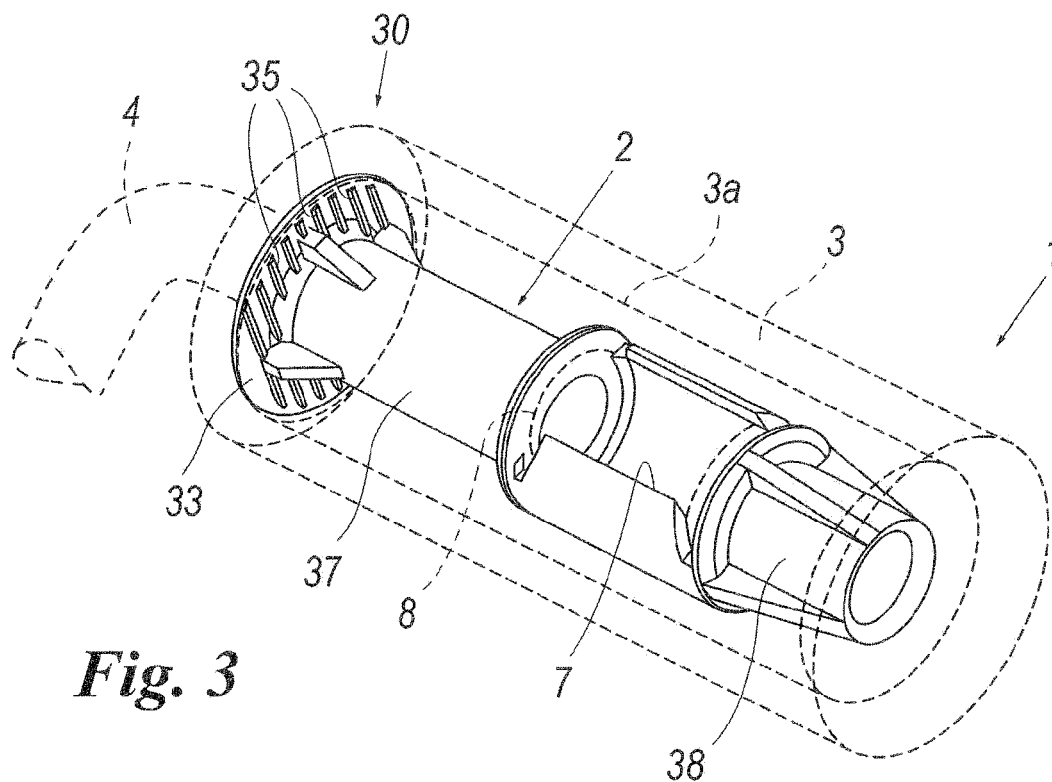


Fig. 3

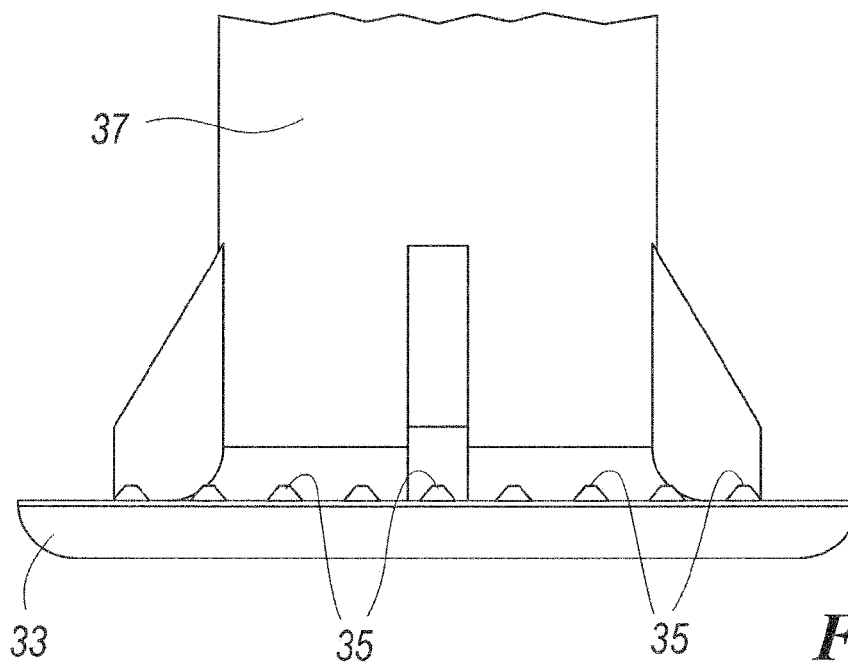


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 09 17 2044

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Place of search Munich		Date of completion of the search 29 December 2009	Examiner Pöll, Andreas
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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