(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 182 108 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.05.2010 Bulletin 2010/18

(51) Int Cl.:
D06F 67/02 *(2006.01)*

(21) Application number: **09174560.4**

(22) Date of filing: **30.10.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

(30) Priority: **31.10.2008 BE 200800591**

(71) Applicant: **Lapauw NV**
8501 Heule (Kortrijk) (BE)

(72) Inventors:
- **Lapauw, Dominique**
  8501 Heule (Kortrijk) (BE)
- **Lapauw, Yves**
  8501 Heule (Kortrijk) (BE)

(74) Representative: **Ostyn, Frans**
K.O.B. NV
President Kennedypark 31 C
8500 Kortrijk (BE)

(54) **Ironing roll and ironing device provided with such ironing roll**

(57) The invention relates, on the one hand, to an ironing roll (1) for an ironing device which is provided with a heatable chest, the ironing roll (1) being provided with a casing, and the ironing roll (1) comprising one or more reinforcement elements (3a, 3b, 3c) which are provided to be connected to the casing and which extend, once connected to this casing, within the casing, the aforementioned reinforcement elements (3a, 3b, 3c) being provided to be releasably connected to the casing. On the other hand, the invention relates to an ironing device, comprising an ironing roll with a casing and a heatable chest, the ironing device comprising an ironing roll (1) according to the invention.

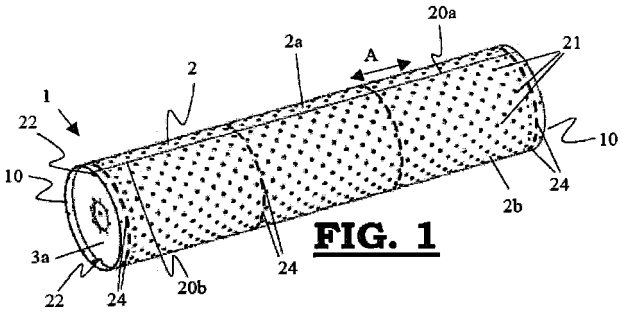

FIG. 1

EP 2 182 108 A1

Description

[0001] The invention relates, on the one hand, to an ironing roll for an ironing device which is provided with a heatable chest, the ironing roll being provided with a casing, and the ironing roll comprising one or more reinforcement elements which are provided to be connected to the casing and which extend, once connected to this casing, within the casing, the aforementioned reinforcement elements being provided to be initially releasably connected to the casing and the aforementioned reinforcement elements being provided on their outer circumference with teeth and the aforementioned casing being provided with slots into which these teeth can be introduced.

[0002] On the other hand, the invention relates to an ironing device provided with an ironing roll with a casing and a heatable chest.

[0003] The existing ironing rolls which are used in an ironing device with a heatable chest have a cylindrical casing.

[0004] A first method for manufacturing an ironing roll of this type is in this case the round-centring of one flat plate with or without perforations having a maximum width of 2 metres, the side edges, which in this manner face one another, being completely welded to one another and a cylindrical tube being in this manner obtained. Since a complete working width of an ironing roll is normally between 3.3 and 4 metres (this is the usual working width of an ironing roll used in an ironing device with a heatable chest), two completely round-centred and welded plates of this type should be welded to each other, next to each other. If the plates have not yet been provided with perforations, the plates are perforated once they have been welded to each other. Reinforcements, which are welded to the plates, are present within the casing.

[0005] The drawback of a method of this type is that the method is very time-consuming. A method of this type has the further drawback that the welding-together of the side edges, which are located opposite one another after the round-centring of the plate, causes the ironing roll to warp and, as a consequence, it is possible to use only thick plates which are less sensitive to warping. If the plates are not provided with perforations, the perforations should be formed, after the tubes have been welded up and welded to one another, by means of machines which are specially designed for this purpose.

[0006] A second method consists in taking a round tube in accordance with standard dimensions, and in then providing the tube with perforations.

[0007] The drawback of a method of this type is that the transportation of tubes having such a large diameter, for example 1.2 or 1.6 m, is very expensive. Furthermore, standard tubes of this type have in all cases a thick wall, in particular usually between 10 and 12 mm; this has the drawback that perforating the tubes is more difficult and should be carried out using machines which are specially designed for this purpose.

[0008] Furthermore, the patent literature describes various sorts of ironing rolls and methods for manufacturing them. However, most ironing rolls are in this case ironing rolls for relatively small models of ironing devices, the method for manufacturing them being unsuitable to obtain sufficiently rigid ironing rolls for relatively large contemporary industrial ironing devices, in which ironing rolls having diameters of 0.3 m and more and lengths of 1 m and more are also employed.

[0009] DE 11 56 755 B describes a method for manufacturing an ironing roll which, after manufacture, can be opened up in order to be able to access machine components located in the ironing roll for maintenance. The ironing roll is in this case constructed from two segments of a circle which can be fastened to one another in four different ways. However, an ironing roll obtained thereby is insufficiently rigid, in a relatively large design, in order to be able to be employed in contemporary industrial ironing devices.

[0010] US 2,325,450 describes, again, an ironing roll which, in a relatively large design, cannot be designed so as to be sufficiently rigid to be employed in contemporary industrial ironing devices. Furthermore, the construction of the ironing roll described in this document is particularly complex, so that the ironing roll cannot be mounted simply and rapidly.

[0011] DE 33 10 019 A1 describes a method for manufacturing an ironing roll wherein a multiplicity of resilient elements are fastened to support rings which together form the casing of the ironing roll. Making the surface of the ironing roll flexible, in conjunction with the necessary rigidity of the roll, is very important for creating a uniform pressure on the items to be ironed and for maintaining this pressure even when the roll winding starts to wear. With an ironing roll as described in DE 33 10 019 A1, it is extremely difficult to obtain a good balance of rigidity versus flexibility of the ironing roll. Furthermore, this balance is, as a consequence of normal wear, less stable over time, so that the resilient elements frequently have to be replaced in order to ensure, again, a good balance. The (dis)mounting of an ironing roll of this type is, in addition, also very laborious, since each of the resilient elements has to be separately attached to the support rings and secured thereto. An ironing roll of this type is therefore also very expensive.

[0012] US 1,715,053 A describes how an ironing roll can be manufactured by attaching separate bent wooden strips next to one another to support rings, the bent wooden strips together forming the casing of the ironing roll. An ironing roll of this type with wooden strips is certainly not suitable to be employed in ironing devices provided with an ironing roll with a casing and a heatable chest. The wooden strips would warp and eventually rot. If the strips were made of metal, this ironing roll would become too heavy and thus much too expensive.

[0013] EP 0 711 861 A1 describes an ironing roll which can already be manufactured much less expensively than the above-described ironing rolls from the prior art.

The ironing roll is constructed from a multiplicity of circular strips which are attached to disc-shaped reinforcement elements, these reinforcement elements being securely welded to a central shaft. Resilient combs are attached between each of the strips. However, in order to design the ironing roll from EP 0 711 861 A1 so as to be sufficiently rigid, the central carrying shaft must be designed so as to be heavy and is thus expensive. Furthermore, the attaching of the large number of circular strips with the resilient combs therebetween is also very time-consuming.

[0014] The object of the invention is, on the one hand, to provide a cylindrical ironing roll for an ironing device which is provided with a heatable chest, wherein the ironing roll can be manufactured in a less laborious, less time-consuming and less expensive manner, the rigidity of the ironing roll also being ensured in relatively large embodiments having a diameter of 0.3 m or more and a length of 1 m or more.

[0015] This object of the invention is achieved by providing an ironing roll for an ironing device which is provided with a heatable chest, the ironing roll being provided with a casing, the ironing roll comprising one or more reinforcement elements which are provided to be connected to the casing and which extend, once connected to this casing, within the casing, the aforementioned reinforcement elements being provided to be initially releasably connected to the casing, the aforementioned reinforcement elements being provided on their outer circumference with teeth and the aforementioned casing being provided with slots into which these teeth can be introduced and the aforementioned reinforcement elements being provided on their outer circumference with first and second teeth, the second teeth having a height which is less than the height of the first teeth, and the second teeth being welded on in the corresponding slots of the aforementioned casing.

[0016] An ironing roll according to the invention no longer requires a heavy and thus expensive central shaft as in the ironing roll from EP 0 711 861 A1. When only teeth of equal height are provided on the reinforcement elements, such as is the case in the ironing roll from EP 0 711 861 A1, either the ironing roll cannot be mounted simply and rapidly or the ironing roll cannot be designed so as to be sufficiently rigid without the heavy and expensive central shaft. If the teeth are designed so as to be sufficiently high to position the casing (which may be constructed from strips or partial casings) neatly with respect to the reinforcement elements in order to mount the reinforcement elements simply and rapidly, then, when welding these teeth on in the corresponding slots of the casing, the weld is, after wearing-away of the casing at the level of this weld, insufficiently strong in order to design the ironing roll so as to be sufficiently rigid without the central shaft. If, however, the teeth are designed so as to be lower in order to obtain sufficiently sturdy welds in order to design the ironing roll so as to be sufficiently rigid without the central shaft, then the casing cannot be positioned sufficiently neatly with respect to the reinforcement elements in order to be able to ensure simple and rapid mounting. By now providing first and second teeth, the first teeth being designed so as to be higher in order to position the casing neatly with respect to the reinforcement elements in order to be able to ensure simple and rapid mounting and the second teeth being designed so as to be lower in order to be able to ensure sturdy welds, the above-mentioned problems from the prior art are remedied.

[0017] In this way, an ironing roll is obtained for an ironing device with a heatable chest that can be manufactured from a thinner material, without that requiring a heavy central shaft, and that is less time-consuming to manufacture, as a result of which an ironing roll of this type can be manufactured in an economically more advantageous manner.

[0018] In a preferred embodiment of an ironing roll according to the invention, the casing of the ironing roll consists of two or more partial casings which are provided to be initially releasably connected to the aforementioned reinforcement elements.

[0019] In an advantageous embodiment of an ironing roll according to the invention, the ironing roll comprises at least two reinforcement elements which are provided to be initially releasably connected at the two ends of the ironing roll to the aforementioned casing or the aforementioned partial casings.

[0020] In a more advantageous embodiment of an ironing roll according to the invention, the aforementioned first and/or second reinforcement element is provided for attaching a bearing arrangement in such a way that the ironing roll can be rotatably arranged in the ironing device.

[0021] In a preferred embodiment of an ironing roll according to the invention, the ironing roll comprises one or more intermediate reinforcement elements which are provided to be initially releasably connected between the ends of the ironing roll to the aforementioned casing or the aforementioned partial casings.

[0022] In a particular embodiment of an ironing roll according to the invention, the aforementioned reinforcement elements are initially releasably connected to the aforementioned casing or the aforementioned partial casings by means of a releasable snap connection.

[0023] In a first more particular embodiment of an ironing roll according to the invention, the aforementioned releasable snap connection between the aforementioned casing or the aforementioned partial casings and a reinforcement element is produced by providing the two ends of the casing or of the aforementioned partial casings, which extend in the longitudinal direction of the ironing roll, with a down folded edge in which a recess is formed that is designed in such a way that the respective reinforcement element can be at least partially introduced into this recess.

[0024] In a second more particular embodiment of an ironing roll according to the invention, the aforemen-

tioned releasable snap connection between the aforementioned casing or the aforementioned partial casings and a reinforcement element is produced by providing the two ends of the casing or of each of the aforementioned partial casings, which extend in the longitudinal direction of the ironing roll, with a down folded edge and by providing the respective reinforcement element with one or more recesses into which the aforementioned down folded edge can be at least partially introduced.

[0025] In an advantageous embodiment of an ironing roll according to the invention, the aforementioned reinforcement elements are designed as annular discs which, after mounting, are in contact over substantially their entire outer circumference with the aforementioned casing or the aforementioned partial casings.

[0026] In a more advantageous embodiment of an ironing roll according to the invention, the aforementioned casing or the aforementioned partial casings are designed as perforated and plate-shaped elements which are curved in such a way that they surround the aforementioned annular discs.

[0027] A further object of the invention is to provide an ironing device which is provided with a heatable chest and a cylindrical ironing roll and can be manufactured in a less laborious, less time-consuming and less expensive manner.

[0028] This object of the invention is achieved by providing an ironing device, comprising an ironing roll with a casing and a heatable chest, the ironing device comprising an ironing roll according to the invention as described above.

[0029] This invention will now be explained in greater depth based on the following detailed description of a preferred ironing roll according to the invention. The purpose of this description is exclusively to provide a clarificatory example and to indicate further advantages and special features of this invention, and may thus in no way be interpreted as a limitation of the scope of the invention or of the patent rights applied for in the claims.

[0030] In this detailed description, reference is made by means of reference numerals to the enclosed drawings, in which:

- Figure 1 shows an ironing roll for an ironing device which is provided with a heatable chest, the ironing roll being provided with a casing consisting of two partial casings, these partial casings being connected to 4 substantially annular discs via a releasable snap connection; and
- Figure 2 shows the ironing roll as shown in Figure 1, one of the two partial casings not being shown.

[0031] A preferred embodiment of a cylindrical ironing roll (1) according to the invention, such as is shown in Figures 1 and 2, consists of a casing which in this preferred embodiment is constructed from two partial casings (2a, 2b). These partial casings (2a, 2b) consist in this case of curved plates, the curvature of these plates being designed in such a way that the ends (20a, 20b) of these plates, which extend in the longitudinal direction (A) of the ironing roll (1), substantially adjoin each other and thus form the complete casing of the cylindrical ironing roll (1). These plates are in this case provided with perforations (21).

[0032] Furthermore, the ironing roll (1) is provided at the two ends (10) thereof, which are positioned transversely to the longitudinal direction (A) of the ironing roll (1), with reinforcement elements (3a, 3c) which are provided to be initially releasably connected to the partial casings (2a, 2b). In this case, the aforementioned first and/or second reinforcement element (3a or 3c) is preferably provided for attaching a bearing arrangement in such a way that the ironing roll (1) can be rotatably arranged in the ironing device.

[0033] Furthermore, 2 intermediate reinforcement elements (3b), which are positioned transversely to the longitudinal direction of the ironing roll (1), are provided between these two ends (10). These intermediate reinforcement elements (3b) are also provided to releasably connect the partial casings (2a, 2b) to these intermediate reinforcement elements (3b). The number of intermediate reinforcement elements (3b) is in this case dependent on the length of the ironing roll (1).

[0034] It is also possible, although this is not shown in the figures,

- to design the casing as one round-centred and perforated plate which is initially releasably connected to the aforementioned reinforcement elements;
- to provide more than two partial casings which are initially releasably connected to the reinforcement elements (3a, 3b, 3c).

[0035] The casing/the partial casings preferably have a thickness of between 2 and 5 mm.

[0036] The initially releasable connection between the casing or the partial casings (2a, 2b) and the reinforcement elements (3a, 3b, 3c) is preferably an initially releasable snap connection.

[0037] For this purpose, on the one hand, the two ends of the casing, which extend in the longitudinal direction (A) of the ironing roll (1), or the two ends (20a, 20b) of each of the aforementioned partial casings (2a, 2b), which extend in the longitudinal direction (A) of the ironing roll (1), can be provided with a down folded edge (22) in which a recess (23) is formed that is designed in such a way that the respective reinforcement element (3a, 3b, 3c) can be at least partially introduced into this recess (23). In the preferred embodiment as shown in Figures 1 and 2, all the reinforcement elements (3a, 3b, 3c) are initially releasably connected to the partial casings (2a, 2b) in this way.

[0038] On the other hand, the two ends of the casing, which extend in the longitudinal direction (A) of the ironing roll (1), or the two ends (20a, 20b) of each of the aforementioned partial casings (2a, 2b), which extend in the

longitudinal direction (A) of the ironing roll (1), can be provided with a down folded edge (22) and the respective reinforcement element (3a, 3b, 3c) can in this case be provided with one or more recesses (23) into which the aforementioned down folded edge (22) can be at least partially introduced (not shown in the figures).

[0039] It is in this case also possible to connect a number of reinforcement elements (3a, 3b, 3c) to the casing or the partial casings (2) in the above-stated first manner, and to connect a number of other reinforcement elements (3a, 3b, 3c) to the casing or the partial casings (2) in the above-stated second manner.

[0040] According to the invention, the reinforcement elements (3a, 3b, 3c) are provided on their outer surface with teeth (30, 31) which are provided to be introduced, preferably in a fitting manner, into slots (24) formed in the casing or the partial casings (2a, 2b). These teeth consist in this case of first and second teeth (30, 31), the second teeth (31) having a height which is less than the height of the first teeth (30), and the second teeth (31) being welded on in the corresponding slots (23) of the aforementioned casing or the aforementioned partial casings (2a, 2b).

[0041] As may be seen in Figures 1, 2, 3a, 3b and 3c, these reinforcement elements (3a, 3b, 3c) are preferably designed as annular discs which, after mounting, are in contact over substantially their entire outer circumference with the aforementioned partial casings (2a, 2b).

Claims

1. Ironing roll (1) for an ironing device which is provided with a heatable chest, the ironing roll (1) being provided with a casing, the ironing roll (1) comprising one or more reinforcement elements (3a, 3b, 3c) which are provided to be connected to the casing and which extend, once connected to this casing, within the casing, the aforementioned reinforcement elements (3a, 3b, 3c) being provided to be initially releasably connected to the casing and the aforementioned reinforcement elements (3a, 3b, 3c) being provided on their outer circumference with teeth (30, 31) and the aforementioned casing being provided with slots (24) into which these teeth (30, 31) can be introduced, **characterized in that** the aforementioned reinforcement elements (3a, 3b, 3c) are provided on their outer circumference with first and second teeth (30, 31), the second teeth (31) having a height which is less than the height of the first teeth (30), and the second teeth (31) being welded on in the corresponding slots (23) of the aforementioned casing.

2. Ironing roll according to Claim 1, **characterized in that** the casing of the ironing roll (1) is constructed from two or more partial casings (2a, 2b) which are provided to be initially releasably connected to the aforementioned reinforcement elements (3a, 3b, 3c).

3. Ironing roll according to Claim 1 or 2, **characterized in that** the ironing roll (1) comprises at least two reinforcement elements (3a, 3c) which are provided to be initially releasably connected at the two ends (10) of the ironing roll (1), which are located transversely to the longitudinal direction (A) of the ironing roll (1), to the aforementioned casing or the aforementioned partial casings (2a, 2b).

4. Ironing roll according to Claim 3, **characterized in that** the aforementioned first and/or second reinforcement element (3a or 3c) is provided for attaching a bearing arrangement in such a way that the ironing roll (1) can be rotatably arranged in the ironing device.

5. Ironing roll according to Claim 3 or 4, **characterized in that** the ironing roll (1) comprises one or more intermediate reinforcement elements (3c) which are provided to be initially releasably connected between the aforementioned ends (10) of the ironing roll (1), which are located transversely to the longitudinal direction (A) of the ironing roll (1), to the aforementioned casing or the aforementioned partial casings (2a, 2b).

6. Ironing roll according to one of Claims 1 to 5 inclusive, **characterized in that** the aforementioned reinforcement elements (3a, 3b, 3c) are initially releasably connected to the aforementioned casing or the aforementioned partial casings (2a, 2b) by means of a releasable snap connection.

7. Ironing roll according to Claim 6, **characterized in that** the aforementioned releasable snap connection between the aforementioned casing or the aforementioned partial casings (2a, 2b) and a reinforcement element (3a, 3b, 3c) is produced by providing the two ends of the casing or the two ends (20a, 20b) of each of the aforementioned partial casings (2a, 2b), which extend in the longitudinal direction (A) of the ironing roll (1), with a down folded edge (22) in which a recess (23) is formed that is designed in such a way that the respective reinforcement element (3a, 3b, 3c) can be at least partially introduced into this recess (23).

8. Ironing roll according to Claim 6 or 7, **characterized in that** the aforementioned releasable snap connection between the aforementioned casing or the aforementioned partial casings (2a, 2b) and a reinforcement element (3a, 3b, 3c) is produced by providing the two ends (20a, 20b) of the casing or of each of the aforementioned partial casings (2a, 2b), which extend in the longitudinal direction (A) of the ironing

roll (1), with a down folded edge (22) and by providing the respective reinforcement element (3a, 3b, 3c) with one or more recesses (23) into which the aforementioned down folded edge (22) can be at least partially introduced.

9. Ironing roll according to one of the preceding claims, **characterized in that** the aforementioned reinforcement elements (3a, 3b, 3c) are designed as annular discs which, after mounting, are in contact over substantially their entire outer circumference with the aforementioned casing or the aforementioned partial casings (2a, 2b).

10. Ironing roll according to Claim 9, **characterized in that** the aforementioned casing or the aforementioned partial casings (2a, 2b) are designed as perforated and plate-shaped elements which are curved in such a way that they surround the aforementioned annular discs (3a, 3b, 3c).

11. Ironing device, comprising an ironing roll with a casing and a heatable chest, **characterized in that** the ironing device comprises an ironing roll (1) according to one of the preceding claims.

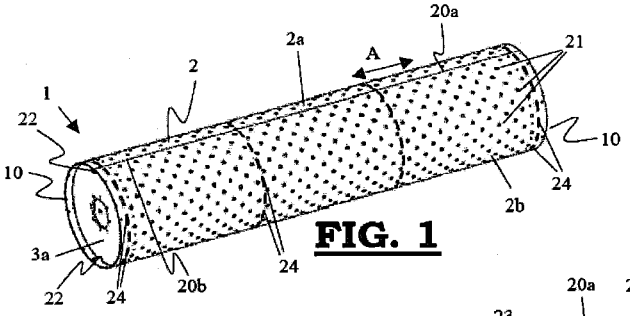

FIG. 1

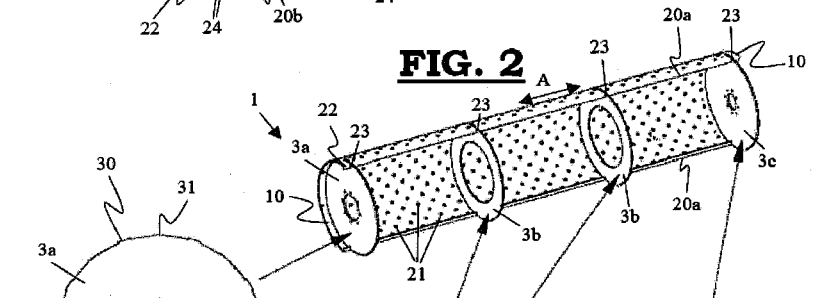

FIG. 2

FIG. 3a

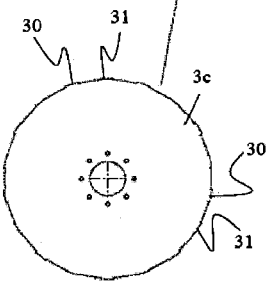

FIG. 3c

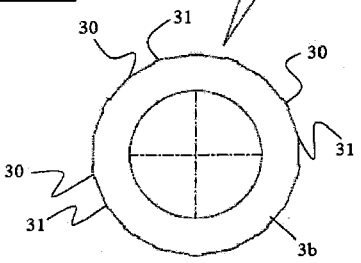

FIG. 3b

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 09 17 4560

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	DE 11 56 755 B (SIEMENS ELEKTROGERAETE GMBH) 7 November 1963 (1963-11-07) * the whole document *	1-2	INV. D06F67/02
A,D	DE 33 10 019 A1 (MIELE & CIE [DE]) 20 September 1984 (1984-09-20) * page 6, last paragraph; claims 1-4,8; figures *	1	
A,D	US 1 715 053 A (BAILES LOYAL F ET AL) 28 May 1929 (1929-05-28) * page 1, line 7 * * page 2, line 54 - line 74; figures 1,2 *	1	
A,D	EP 0 711 861 A (DUBIX DE SOUZA SNC [FR] ELECTROLUX SYST BLANCHISSERIE [FR]) 15 May 1996 (1996-05-15) * column 2, line 41 - line 45; figures 4,5 * * column 5, line 50 - column 6, line 35 * * column 7, line 22 - line 29 *	1-11	TECHNICAL FIELDS SEARCHED (IPC)
A,D	US 2 325 450 A (WARDWELL JR GEORGE W) 27 July 1943 (1943-07-27) * page 1, line 1 - line 9 * * page 2, line 7 - line 25; figures 8-10 *	1	D06F
A	US 2 044 640 A (FRITZ SCHUSTER) 16 June 1936 (1936-06-16) * the whole document *	1	
A	US 1 743 446 A (FULTON CLIFFORD W) 14 January 1930 (1930-01-14) * the whole document *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 February 2010	Uhlig, Robert

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 17 4560

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-02-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 1156755 B	07-11-1963	NONE	
DE 3310019 A1	20-09-1984	NONE	
US 1715053 A	28-05-1929	NONE	
EP 0711861 A	15-05-1996	DE 69515595 D1	20-04-2000
		DE 69515595 T2	02-11-2000
		DE 711861 T1	24-10-1996
		DK 711861 T3	21-08-2000
		FR 2726835 A1	15-05-1996
US 2325450 A	27-07-1943	NONE	
US 2044640 A	16-06-1936	NONE	
US 1743446 A	14-01-1930	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

- DE 1156755 B **[0009]**
- US 2325450 A **[0010]**
- DE 3310019 A1 **[0011]**
- US 1715053 A **[0012]**
- EP 0711861 A1 **[0013] [0016]**