



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 700 945 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
13.09.2006 Bulletin 2006/37

(51) Int Cl.:
D06F 71/29 (2006.01)

(21) Application number: **05425145.9**

(22) Date of filing: **11.03.2005**

(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 MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL BA HR LV MK YU

(72) Inventor: **Rotondi, Andrea**
20019 Settimo Milanese (Milano) (IT)

(74) Representative: **Ferrari, Barbara**
Botti & Ferrari S.r.l.,
Via Locatelli, 5
20124 Milano (IT)

(71) Applicant: **Rotondi Group S.R.L.**
20019 Settimo Milanese (Milano) (IT)

(54) **Trousers ironing apparatus, in particular for ironing fore and rear pockets of the trousers**

(57) A trousers ironing apparatus, in particular for ironing fore (5) and rear (6) pockets of the trousers (2), which achieves a faultless ironing on trousers of any size with incredible structural and functional simplicity, comprises an inner body (8) for supporting the trousers (2), made of two opposite half-bodies (9) being mobile away from and towards in a substantially horizontal direction (XX) between a first tensioning position of the trousers (2) to be ironed and a second position to free the ironed trousers (2), padding means (10) of the trousers (2) in correspondence with the pockets (5, 6) being mobile towards and from the opposite half-bodies (9) when in the first position, wherein the padding means (10) comprise, for each half-body (9), and attachment (11) being mobile substantially in said horizontal direction (XX) towards and away from the respective half-body (9) and provided with at least one wing (13, 14) being angularly flag-like shiftable from a position far from the half-body (9) and a position in pressing contact with the half-body (9) for ironing the respective pocket (5, 6).

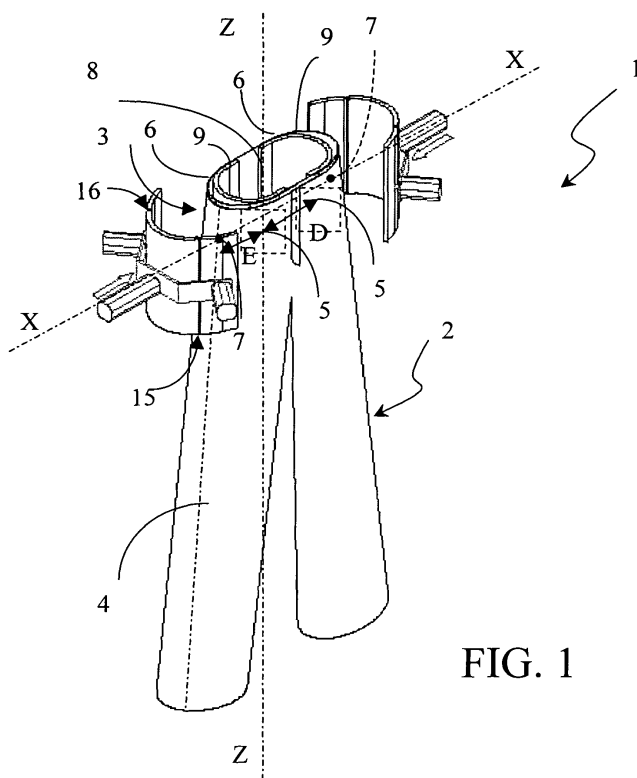


FIG. 1

EP 1 700 945 A1

Description**Field of application**

5 [0001] The present invention relates to a trousers ironing apparatus in particular for ironing fore and rear pockets of the trousers.

[0002] The invention particularly, but not exclusively, relates to an industrial ironing apparatus and the following description is made with reference to this field of application for convenience of explanation only.

Prior art

10 [0003] As it is well known, in the field of trousers industrial ironing, and in particular trousers without creases, there exists the need of providing to a proper ironing of the pockets and in particular to maintaining the trousers pocket area between surfaces in pressing contact so as to avoid, when ironing the trousers, commonly realised by blowing hot air
15 inside the trousers, the reversal outside the pockets themselves.

[0004] According to a known solution, the pockets ironing apparatus comprises two U-like shaped shells, each of them being mobile towards a respective half-body and having wings being long enough to encompass the trousers in correspondence with the hip area and pockets.

20 [0005] Although substantially meeting the aim, such an apparatus suffers from the drawback of a non perfect ironing of the pockets due to the always possible forming of pleats caused by the shift and crawling of the shells on the trousers.

[0006] Apparatuses have also been suggested equipped with suitable plates for each rear pocket and for each fore pocket being mobile for coming in pressing contact with the half-bodies in correspondence with the pockets themselves for ensuring the desired maintenance and ironing.

25 [0007] Although meeting the aim, such machine has proved to be constructively complex and laborious in the adjustment, requiring a regulation of the distance between the plates according to the size of the trousers to be ironed, with all the well known drawbacks, when there are positional changes of machine elements, with all the implications of blockings, manoeuvres and releases.

[0008] The technical problem underlying the present invention is that of meeting the above-indicated need, overcoming the drawbacks cited with reference to the known technique.

Summary of the invention

30 [0009] The present invention has been devised following the observation that the rear and fore pockets of the trousers which have centres distance being variable from size to size are in reality in a constant spaced relation from the hips of the trousers themselves for all the sizes.

35 [0010] On the basis of the previous observation and as solution to the above technical problem the present invention provides an apparatus of the specified type which is characterised in that it comprises padding means having an attachment which is mobile substantially in a horizontal direction (XX) towards and away from a respective half-body and provided with at least a wing being angularly flag-like mobile from a position far from the half-body to a position in pressing contact with the half-body for ironing of a respective pocket.

40 [0011] The characteristics and advantages of the apparatus according to the invention will be apparent from the following description of an embodiment thereof given by way of indicative and non limiting example with reference to the annexed drawings.

Brief description of the drawings

45 [0012] In such drawings:

Figure 1 schematically shows a perspective view of an apparatus according to the invention;

50 Figure 2 schematically shows a top view of the apparatus of Figure 1;

Figures 3 and 5 schematically show a perspective view of the apparatus of Figure 1 in subsequent steps of its operation;

55 Figures 4 and 6 schematically show a top view of the apparatus of Figures 3 and 5, respectively.

Detailed description

[0013] With reference to the annexed figures, 1 globally indicates an apparatus for ironing trousers 2, according to the present invention. The apparatus 1 comprises a frame for supporting the hereafter described parts, per se conventional and not shown in the figure so as not to weight it.

[0014] In particular, the trousers 2 are arranged in the apparatus 1 with substantially vertical order according to the axis ZZ with a waist area 3 arranged on top with respect to a leg area 4.

[0015] It is to be noted that the trousers 2, in correspondence with the waist area 3, have two opposite hip areas 7, as well as rear 5 and fore 6 pocket areas adjacent to the hip areas 7.

[0016] By way of indication, the trousers 2 shown in figure are chosen of a medium size, for example a size 44, with centres distance D between the fore pockets and the rear pockets approximately equal to 300 mm. It is clear that the apparatus 1 is suitable for ironing a wide range of sizes for example from size 38 to size 56. For size 44, as for all the sizes, the distance between the pockets and the hip is indicated with E.

[0017] The apparatus 1 according to the invention comprises an inner body 8 for supporting the trousers 2, said inner body 8 being active in the waist area 3, and made of two opposite half-bodies 9 being mobile away from and towards in a substantially horizontal direction along the axis XX, perpendicularly to the axis ZZ. It is to be noted that the trousers 2 are supported so that the axis XX passes by the hip areas 7.

[0018] The mobile half-bodies 9, when in a spaced position, maintain the trousers 2 in correspondence with the suitably tensioned waist area 3, for supporting the trousers 2 themselves.

[0019] When instead the mobile half-bodies 9 are in close position, they leave the trousers 2 free for their removal once the ironing has been performed.

[0020] The apparatus 1 also comprises padding means 10 for padding the trousers in correspondence with the fore 5 and rear 6 pockets.

[0021] In particular, the padding means 10 comprise two mobile attachments, each one indicated with 11, moving away from and towards with each other along the horizontal axis XX between a spaced position from the half-bodies 9 and a position being in pressing contact with the half-bodies 9.

[0022] It is to be noted that each mobile attachment 11 advantageously comprises a central arcuate portion 12, shaped for shifting the hip area 7 of the trousers 2 when tensioned by the half-bodies 9, as well as two wings, 13 and 14 and precisely a fore wing 13 and a rear wing 14, each one shaped for shifting the fore pocket 5 and the rear pocket 6, respectively.

[0023] Advantageously, the two wings 13 and 14 are supported by the central portion 12 in an angularly flag-like shiftable way around respective hinges 15 and 16, having respective vertical axes aa and bb, between an open position, wherein they are spaced from the trousers 2, and a closed position wherein they are in pressing contact against the respective fore 5 and rear 6 pockets of the trousers 2 themselves.

[0024] In other words, the above described mobile attachments 11 is an articulated attachments, substantially U-like shaped, wherein a fixed central part 12, being the U base, supports the wings 13, 14, being the U wings, in an angularly shiftable way with subsequent closing and opening of the U according to the need.

[0025] It is to be noted that the apparatus 1 is completed by motor means 17 for activating the mobile half-bodies 9. In particular, the motor means 17 comprise for each half-body 9 a fluid cylinder-piston group 18, for example pneumatic, wherein a cylinder 19 is fixedly supported by the frame and a piston 20 is integral with a respective half-body 9 for its control and support.

[0026] The apparatus 1 also comprises motor means 21 for activating the mobile attachments 11. In particular, the motor means 21 comprise, for each mobile attachment 11, a cylinder-piston group 22 active on a respective central portion 12 for its shift along the axis XX. In particular, the cylinder-piston group 22 comprises a cylinder 23 fixedly supported by the frame and a piston 24 being integral with the central portion 12 for its control and support. The motor means 21 also comprise, for each wing 13 and 14, a respective cylinder-piston group, 25 and 26, active on the wing for its angular flag-like shift. Each cylinder-piston group 25 (26) comprises a cylinder 27 (28) rigidly supported by means of a stirrup 29 (30) to the central portion 12 and a piston 31 (32) active on the wing for its control.

[0027] The cylinder-piston groups are supplied with fluid pressure being adjustable at will so as to attain specific ironing pressures independent from one another on the different areas of the trousers.

[0028] The apparatus 1 is completed by supply means, for supplying an ironing fluid (hot air and steam) inside the trousers 2 to be ironed. Advantageously, the supply means have branches for sending the ironing fluid to the mobile attachments 11, and in a particular way to the wings 13 and 14.

[0029] In other words, in the apparatus 1 according to the invention, the wings 13 and 14 are provided with ironing means, in particular equipped with adduction conduits of the ironing fluid (hot air and steam) and/or resistance heating means, for the faultless ironing of the fore 5 and rear 6 pocket areas.

[0030] Advantageously, also the central portion 12 of the mobile attachments 11 is provided with ironing means, in a similar way as the wings 13 and 14, for the faultless ironing of the hip area 7.

[0031] The operation of the apparatus 1 according to the invention is hereafter described with reference to an initial condition, shown in figures 1 and 2, wherein the apparatus 1 has the half-bodies 9 close, the mobile attachments 11 spaced apart and the wings 13 and 14 open.

[0032] The apparatus has just received the trousers 2 to be ironed which are presented to the apparatus with the waist area 3 maintained at the height of the inner body 8.

[0033] At this point, the half-bodies 9 of the inner body 8 are spaced apart by means of the respective cylinders 19 in the direction of the arrows F1 with consequent tensioning of the waist area 3 and steady maintenance of the trousers 2 according to its vertical direction ZZ.

[0034] At this point, the mobile attachments 11 are brought close by means of cylinder-piston groups 22 in the direction of the arrows F2 until the central portions 12 come into pressing contact against the hip areas 7 of the trousers 2, as shown in the figures 3 and 4.

[0035] Finally, the wings 13 and 14 of the mobile attachments 11 are closed by means of the respective cylinder-piston groups 25 and 26 in the direction of the arrows F3 until they come into pressing contact with the fore 5 and rear 6 pockets, respectively, reaching the position shown in figures 5 and 6 wherein the apparatus is ready to perform the desired ironing step of the trousers and in particular of the fore and rear pockets.

[0036] Once such step has been finished, the operation starts again backwards until the initial position is obtained again, with release of the ironed trousers, the apparatus being thus ready for the ironing of subsequent trousers.

[0037] A method for ironing trousers pockets comprises the steps of:

- providing an articulated mobile attachment 11 being U-shaped and having a central portion 12 and wings 13 and 14 being angularly flag-like shiftable for the U opening and closing;
- bringing the articulated mobile attachment 11 close to an open U-like trousers 2 until the central portion 12 comes into pressing contact with the trousers 2; and
- closing the U by shifting the wings 13 and 14 until the wings 13 and 14 come into pressing contact with pockets 5 and 6 of the trousers 2.

[0038] It is in fact to be noted that, differently from the above referred centres distance D, which varies from size to size, the distance between the pockets and the hip area of the trousers, distance indicated with E in the figure, is fixed and independent from the sizes. Thus, advantageously according to the invention, the wings 13 and 14 are suitably sized so as to realise, together with a part of the central portion 12, exactly such distance E. In such way, the wings 13 and 14 are always placed in correspondence with the pockets 5 and 6, independently from the size of the trousers 2.

[0039] The invention has the advantage of achieving a faultless ironing of the trousers and of its pockets with an apparatus of incredible structural and functional simplicity.

[0040] The invention also has the important advantage of allowing the ironing of trousers in a wide range of sizes, since the apparatus automatically adapts to the size of the trousers to be ironed, without laborious and potentially dangerous manoeuvres of parts ordering by skilled staff.

[0041] A further advantage stays in that the apparatus according to the invention can be easily inserted in ironing plants being already existent.

[0042] Obviously, a skilled in the art will bring several modifications and changes to the apparatus above described and shown in the figures, so as to meet specific and contingent needs, all the modifications being however within the scope of protection of the present invention as defined by the following claims.

Claims

1. Trousers ironing apparatus, in particular for ironing fore (5) and rear (6) pockets of the trousers (2), of the type comprising an inner body (8) for supporting the trousers (2), made of two opposite half-bodies (9) being mobile away from and towards in a substantially horizontal direction (XX) between a first tensioning position of the trousers (2) to be ironed and a second position to free the ironed trousers (2), as well as padding means (10) of the trousers (2) in correspondence with the pockets (5, 6) mobile towards and from the opposite half-bodies (9) when in the first position, **characterised in that** said padding means (10) comprise, for each half-body (9), a mobile attachment (11) substantially in said horizontal direction (XX) towards and away from the respective half-body (9) and equipped with at least one wing (13, 14) angularly and flag-like shiftable from a position being far from the half-body (9) to a position being in pressing contact with the half-body (9) for ironing of the respective pocket (5, 6).
2. Apparatus according to claim 1, **characterised in that** said wings (13, 14) are two, flag-like shiftable from and

towards a fore pocket (5) and a rear pocket (6) of the trousers (2) respectively.

3. Apparatus according to claim 1, **characterised in that** the mobile attachment (11) comprises a central portion (12) being adjacent to said at least one wing (13, 14) for coming into pressing contact with a hip area (7) of the trousers (2), adjacent to said at least one pocket (5, 6).

4. Apparatus according to claim 1, **characterised in that** it comprises motor means (21) for the flag-like shift of said wings (13, 14).

5. Apparatus according to claim 1, **characterised in that** said motor means (21) comprise fluid cylinder-piston groups (25, 26).

6. Apparatus according to claim 1, **characterised in that** said flag-like shiftable wings (13, 14) comprise ironing means.

7. Apparatus according to claim 6, **characterised in that** said ironing means comprise conduits for the adduction of an ironing fluid.

8. Apparatus according to claim 6, **characterised in that** said ironing means comprise resistance heating means.

9. Apparatus according to claim 3, **characterised in that** said central portion (12) comprises ironing means.

10. Apparatus according to claim 9, **characterised in that** said ironing means comprise conduits for the adduction of an ironing fluid.

11. Apparatus according to claim 9, **characterised in that** said ironing means comprise resistance heating means.

12. Method for ironing trousers pockets comprising the steps of:

- providing an articulated mobile attachment (11) being U-like shaped and having a central portion (12) and wings (13, 14) being angularly flag-like shiftable for the opening and the closing of the U;
- bringing the articulated mobile attachment (11) close to an open U-like trousers (2) until the central portion (12) comes into pressing contact with the trousers (2); and
- closing the U by flag-like shifting the wings (13, 14) until the wings (13, 14) come into pressing contact with pockets (5, 6) of the trousers (2).

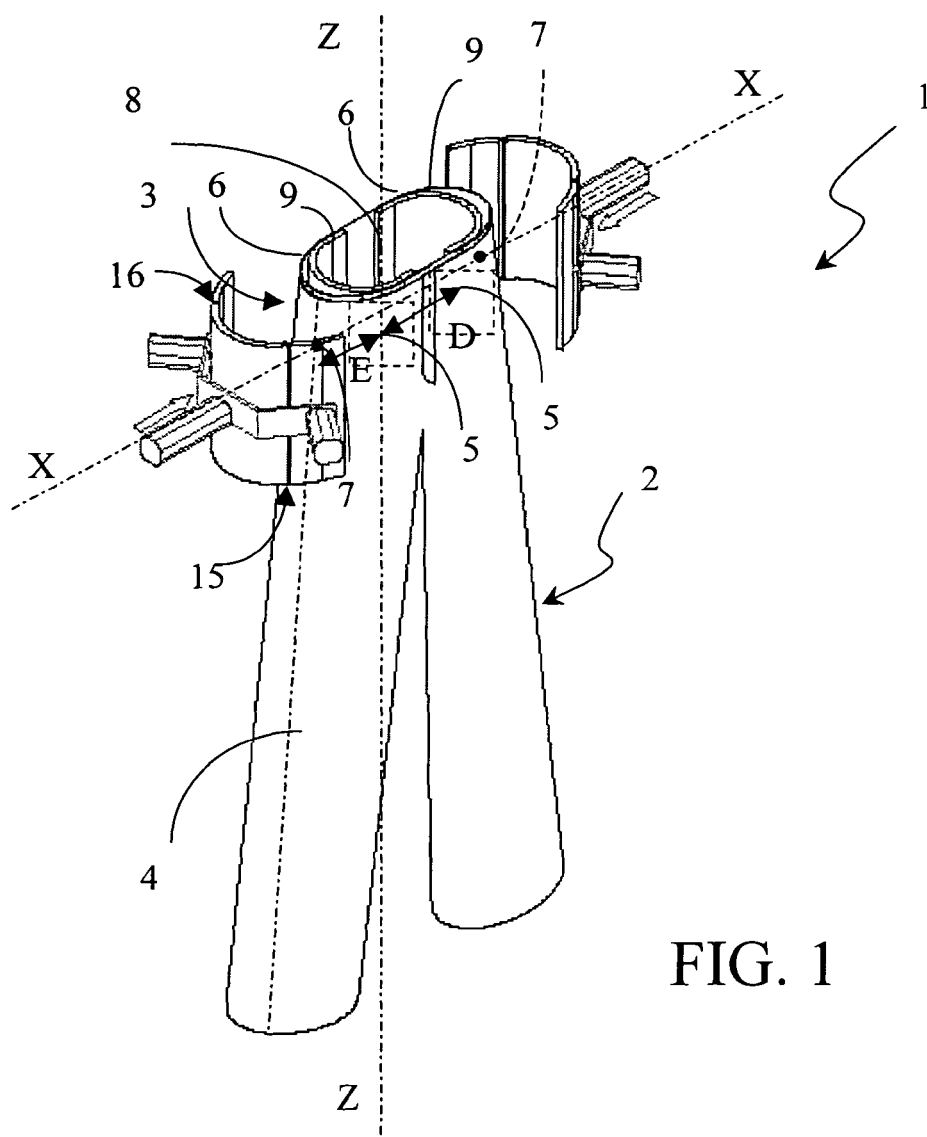


FIG. 1

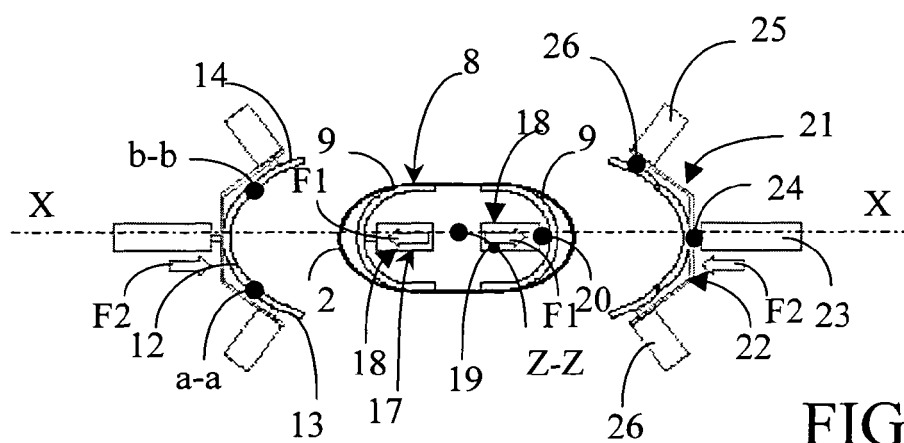


FIG. 2

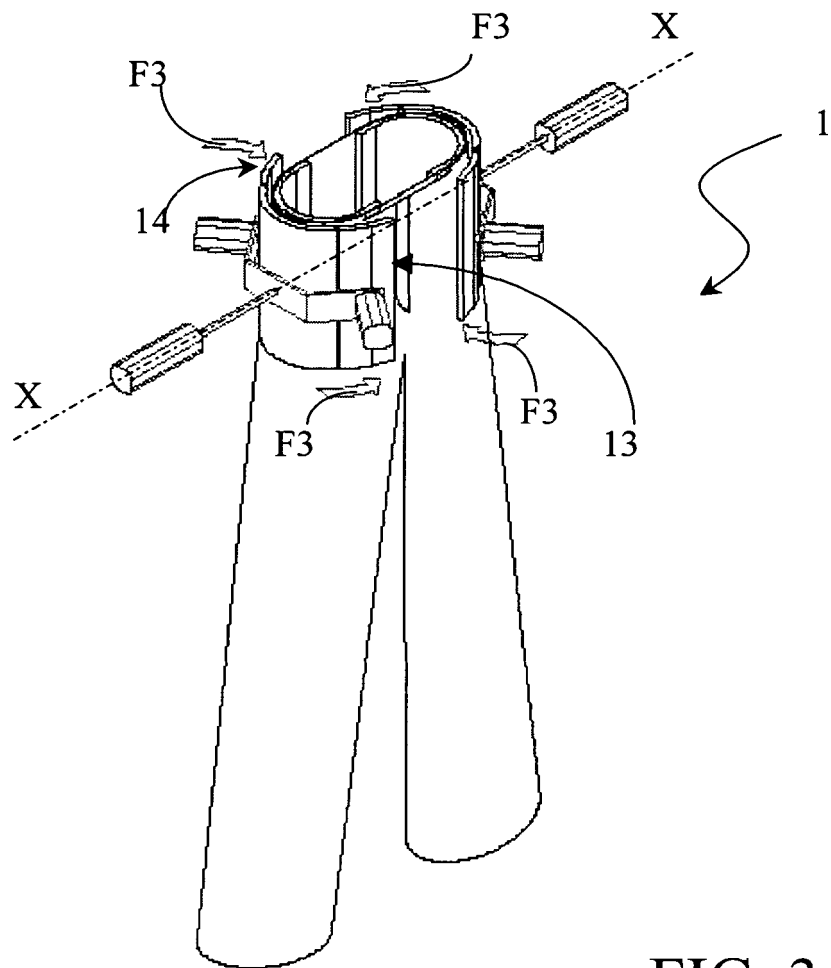


FIG. 3

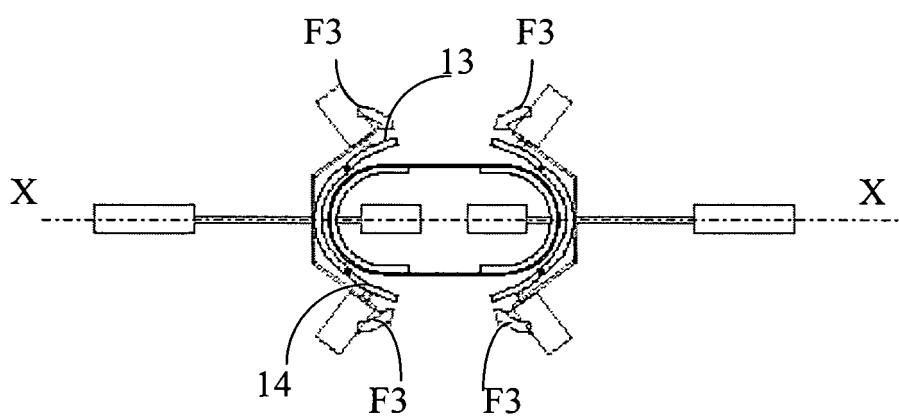


FIG. 4

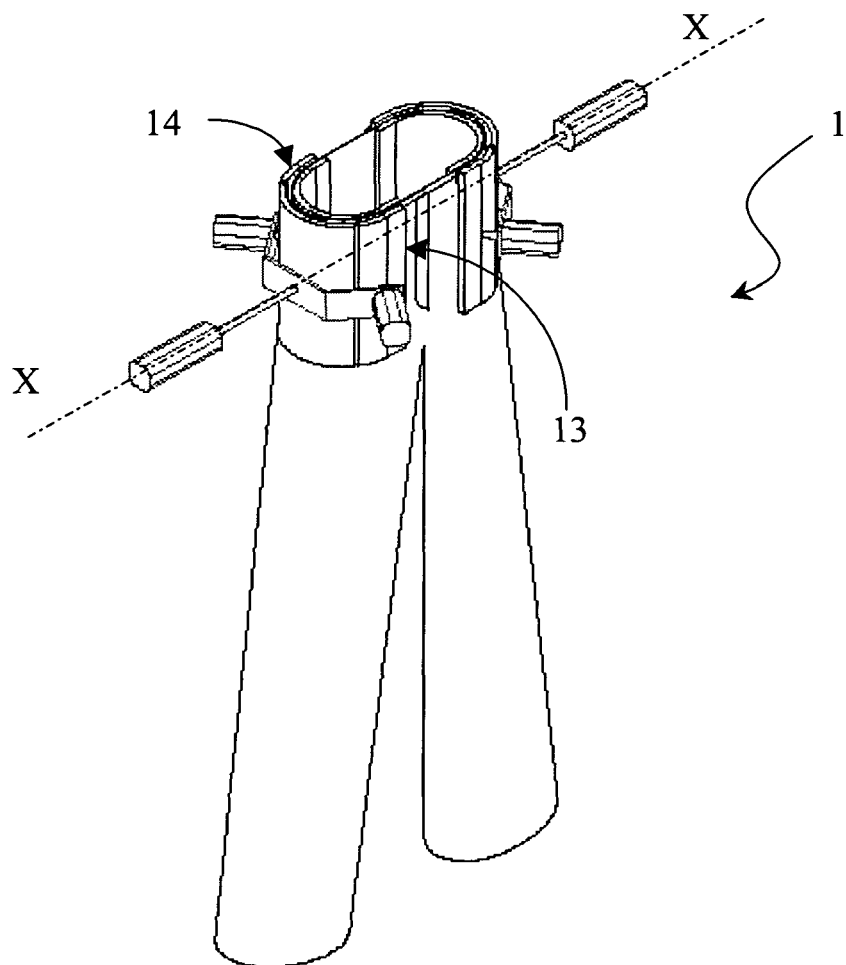


FIG. 5

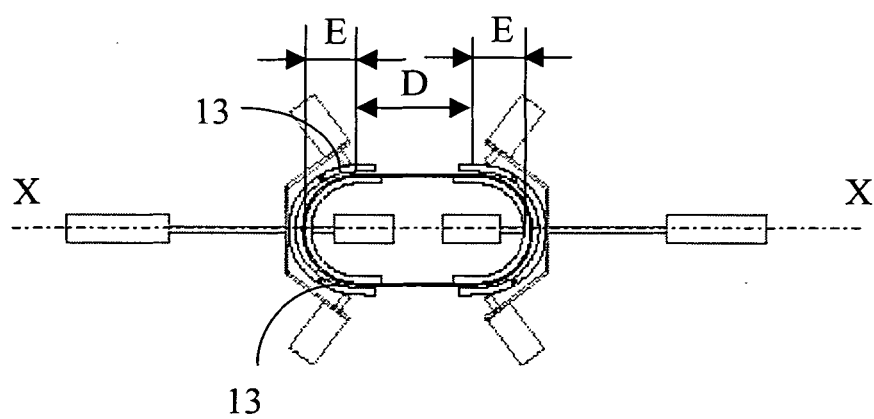


FIG. 6



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 42 5145

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 241 293 A (MACPI S.P.A. PRESSING DIVISION) 18 September 2002 (2002-09-18) * column 3, paragraph 11 - column 5, paragraph 25; figures 4,7,10,12,13,18-20 *	1-12	D06F71/29
A	US 6 052 916 A (TASONIERO ET AL) 25 April 2000 (2000-04-25) * the whole document *	1-12	
A	FR 2 311 135 A (GUILLON PIERRE) 10 December 1976 (1976-12-10) * the whole document *	1-12	
A	US 2 956 714 A (ROSENTHAL LEIGHTON A ET AL) 18 October 1960 (1960-10-18) * the whole document *	1-12	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			D06F
Place of search		Date of completion of the search	Examiner
Munich		26 July 2005	Lodato, A
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			

1
EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 42 5145

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.

26-07-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1241293	A	18-09-2002	IT MI20010534 A1	13-09-2002
			BR 0200781 A	07-01-2003
			CN 1375596 A	23-10-2002
			EP 1241293 A2	18-09-2002
			MX PA02002429 A	22-06-2004
			US 2002130147 A1	19-09-2002

US 6052916	A	25-04-2000	IT VR960007 A1	23-04-1996
			AT 220739 T	15-08-2002
			AU 1319397 A	20-08-1997
			BR 9707188 A	06-04-1999
			CA 2244375 A1	31-07-1997
			CN 1212035 A ,C	24-03-1999
			DE 69714012 D1	22-08-2002
			DE 69714012 T2	13-03-2003
			EP 0876527 A1	11-11-1998
			ES 2180920 T3	16-02-2003
			WO 9727355 A1	31-07-1997
			JP 2000509288 T	25-07-2000
			PL 328061 A1	04-01-1999
			PT 876527 T	31-12-2002
			TR 9801428 T2	21-10-1998

FR 2311135	A	10-12-1976	FR 2311135 A1	10-12-1976

US 2956714	A	18-10-1960	NONE	
