



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 482 084 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

01.12.2004 Bulletin 2004/49

(51) Int Cl.7: **D06F 75/12, D06F 75/20**

(21) Application number: **03012405.1**

(22) Date of filing: **30.05.2003**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**

Designated Extension States:

AL LT LV MK

(72) Inventor: **Pineschi, Massimiliano**

41010 Villanova (MO) (IT)

(74) Representative: **Crugnola, Pietro et al**

Luppi Crugnola Bergamini & Partners S.r.l.

Viale Corassori, 54

41100 Modena (IT)

(30) Priority: **30.05.2003 IT MO20020149**

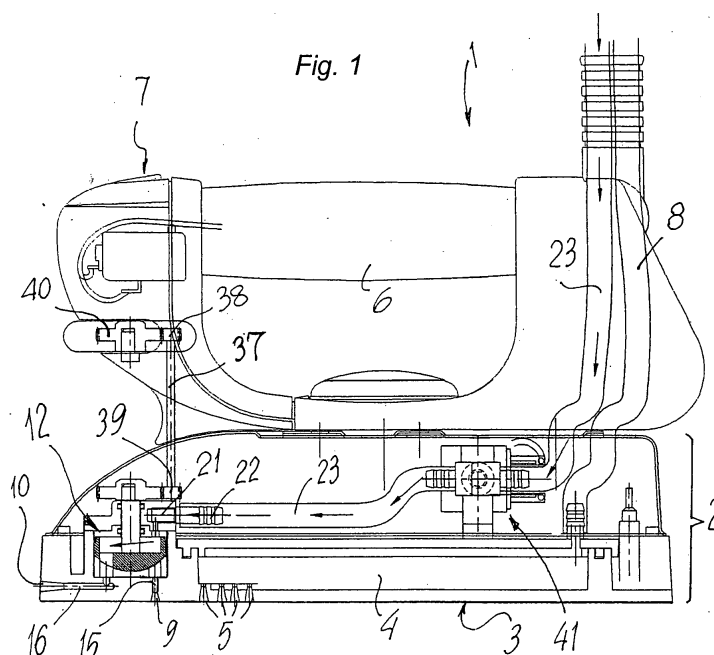
(71) Applicant: **T.P.A. IMPEX S.p.A.**

36030 Romano d'Ezzalino (VI) (IT)

(54) **Professional and semi-professional steam iron**

(57) A professional and semi-professional steam iron (1) comprises a base plate (2) equipped with a lower ironing surface (3), an internal steam chamber (4), and downwards-oriented first set of steam ejection holes (5) connected with the internal steam chamber (4); an upper handle (6) fixed to the base plate (2) and equipped with a control (7) which activates the pulsed ejection of steam from the first set of holes (5); and a duct (8) which conveys the steam from the generator to the said internal steam chamber (4). The base plate (2) further comprises at least one second set of steam ejection holes (9) oriented downwards, independent of the first set (5),

at least one third front steam ejection hole (10) substantially located at the tip of the said base plate (2) and connected to the generator, at least one fourth pair of steam ejection holes (11) located on either side of the third front ejection hole (10) on the front sides of the base plate (2) and connected with the generator, and selection means (12) for selecting the ejection of steam from the second set of holes or third front hole or fourth pair of side ejection holes; and control means (13) for controlling the selection means (12) located externally to the base plate (2) and a second conveyance means (23) for converging the steam from the generator to the selection means (12).



Description

[0001] The present invention concerns a steam iron for professional and semi-professional use.

[0002] Steam irons equipped with an external heater for generating steam connected to the iron by a flexible hose are known and have long been in general use.

[0003] Irons of this kind are generally defined as professional or semi-professional, inasmuch as they are suitable for users for whom ironing is their profession or a considerable part thereof.

[0004] Such users are often required to iron, even for several hours without interruption, fabrics sewn in such a way as to make access of the iron difficult, or are required to prepare for ironing sections of fabric at high temperature, in close proximity to sections of fabric requiring treatment at a more moderate temperature.

[0005] Furthermore, such users also require the steam to be directed in various directions relative to the normal direction of motion given to the iron by the user's hand.

[0006] Currently known irons are not capable of delivering two different temperatures for adjacent pieces of fabric with differing characteristics, with a single iron, if not by changing the temperature of the iron between sections of fabric, which results in a considerable loss of time due to the need to allow the iron time to change its temperature in contrast to the phenomenon of thermal inertia.

[0007] Furthermore, known irons only deliver jets of steam in two main directions, that is, downwards via holes machined in the base plate, and forwards relative to the iron itself, aligned with the point of the base plate and the longitudinal axis of the iron.

[0008] This constrains users, when directing the jets of steam in various directions, for instance laterally, to make use of fatiguing twisting motions of the wrist which can result in fatigue and pain to the joints if repeated frequently throughout the day's work.

[0009] The object of the present invention is to eliminate the above mentioned disadvantages of the known art by conceiving a professional and semi-professional steam iron which provides and issues steam of at least two different temperatures, and which also permits the user to direct the jets of steam as desired, even in directions divergent from the downwards direction orthogonal to the base plate and that directed from the tip of the plate, without thereby requiring fatiguing twisting motions of the wrist of the hand holding the iron.

[0010] This object and these aims are all achieved by the present professional and semi-professional steam iron which comprises a base plate equipped with a lower ironing surface and an internal steam chamber and a first set of holes directed downwards and connected to the said chamber, an upper handle fixed to the base plate and equipped with a control which activates the ejection of steam in pulses from the first set of holes, and a duct which conveys the steam from the generator

to the said internal steam chamber, characterised by the fact that the said base plate also includes: at least a second set of steam ejection holes oriented downwards, independent of the first set, at least a third front steam ejection hole substantially located at the tip of the said base plate and connected to the generator, at least a fourth pair of steam ejection holes located one on either side of the third front ejection hole on the front sides of the base plate and connected with the generator, means for selecting the ejection of steam from the second set of holes and/or third front hole and/or fourth pair of side ejection holes; control means for controlling said selection means located externally to the base plate, and second conveyance means for converging the steam from the generator to the said selection means.

[0011] Further advantages of the invention will be more clearly understood from the detailed description of a preferred, but not exclusive, embodiment of a professional and semi-professional steam iron, depicted by way of not limiting example in the attached drawings in which:

Fig. 1 is a lateral see-through view of the steam iron according to the present invention;

Fig. 2 is the corresponding top see-through view of figure 1;

Fig. 3 is a detailed see-through view of the front portion of the steam iron according to the present invention;

Fig. 4a to 4c show schematically the control positions of the selection means of the steam iron according to the present invention, removed from their normal upper location for a better view.

[0012] With reference to the above figures, a professional and semi-professional steam iron is overall indicated with reference numeral 1, which iron usually comprises a base plate 2 equipped with a lower ironing surface 3, an internal steam chamber 4 and first set of holes 5 through which the steam is ejected and which are oriented downwards and connected with the steam chamber 4.

[0013] Over the base plate 2 is rigidly mounted a handle 6 fitted with a control 7, for instance a switch, for pulse activation of the ejection of the steam via the first set of holes 5. Steam is delivered by a generator (not illustrated), which may for example be composed of a separate heater and is conveyed to the internal chamber 2 via a duct 8.

[0014] According to the invention, The base plate 2 is further provided with a second set of holes 9 for ejection of the steam, which holes are oriented downwards like those constituting the first set 5, but independent of the latter and connected to the generator. The plate 2 further comprises a third hole 10 for forwards ejection of the steam, located substantially on the tip of the plate 2, also connected to the generator, and at least a fourth pair of holes 11 for ejection of the steam from both sides, locat-

ed on both sides of the third front hole 10 and substantially close thereto, on the front sides of the plate 2.

[0015] The iron 1 is equipped with selection means 12, for selecting the ejection of steam alternatively from the said second set of holes 9 or third front hole 10 or fourth pair of side holes 11, as required by the user. To make the selection, the user can active the controls means 13 located in a suitable position externally to the base plate 2, and more precisely on the handle 6 in an ergonomic position.

[0016] The steam is conveyed to the said second holes 9, third front hole 10 and fourth pair of side holes 11 via a second conveyance means 14.

[0017] Furthermore the above second set of holes 9, third front hole 10 and fourth pair of side holes 11 are connected respectively with independent ducts 15, 16, 17 to the selection means 12. Such selection means comprise a box-form casing 18 having an upper half-casing 19 and a lower half-casing 20, which are specifically integral with the base plate 2 and may be mutually fixed to each other. The upper half-casing 19 is provided with a first slot 21, preferably having an intake 22 for steam intake and suitable to be coupled to the second means of conveyance 14, in practice a second duct 23.

[0018] According to a first embodiment of the steam iron 1, a second slot 24, two third slots 25 and a fourth slot 26 are formed into the lower half-casing 20: these latter are connected via the respective independent ducts to the above third front hole 10, fourth pair of side holes 11 and second set of holes 9.

[0019] Inside the box-form casing 18 a shutter 27 is mounted with substantially circular plane section which operates to open alternately the second slot 24 or third pair of slots 25 or fourth slot 26. To this end, the shutter 27 is equipped with at least a fifth pair of through holes 127 and 227, set at a predefined angle from each other, and is mounted to rotate tightly in the said box-form casing 18, operated externally from the plate 2 by the means of actuation means 28.

[0020] According to a second embodiment of the iron 1, for better handling of the shutter 27, between the upper half-casing 19 and the lower one 20 and the shutter itself 27, are interposed low friction means, which are essentially composed of at least two blocks 29, 30 superposed and coaxial, each mounted rigidly to their respective half-casing comprising between them a seat 31 for the rotary mounting of the shutter 27.

[0021] In this case, it is the lower fixed block 30, instead of the lower half-casing 20, which is perforated by the second slot 24, third slots 25 and fourth slot 26 with which the said through holes 127 and 227 machined into the shutter 27 align vertically.

[0022] In both embodiments, the said second slot 24, third slots 25 and fourth slot 26 are disposed in the lower half-casing 20 or in the lower block 30 according to a first circular generating line 200 oriented substantially horizontally.

[0023] In particular, the second slot 24 is symmetri-

cally inserted between the two third slots 25 and diametrically opposed to the fourth slot 26 (see figures 4a, 4b, 4c).

[0024] Furthermore the third slots 25 are spaced by a first circumferential arc of predefined amplitude "x" and together with the second slot 24 are oriented towards the front of the iron 1.

[0025] The fifth through holes 127 and 227 are also arranged according to a second circular generating line 201 with substantially horizontal orientation, with radius equal to that of the first generating line 200 and concentrically superimposed on it; correspondingly, the holes 127 and 227 of that couple of fifth through holes are inter-spaced by a second circumferential arc of amplitude "y" equal to that of the said first arc "x".

[0026] To summarise, the arrangement of the said holes 127 and 227 as well as of the second slot 24, third slots 25 and fourth slot 26 allows for alternate vertical alignment by superposition: in figure 4a the second slot 24 is aligned with hole 127, in figure 4b the third slots 25 are aligned at the same time with both fifth slots 127 and 227 and in figure 4c the fourth slot 26 is aligned with hole 227, all of which is done by rotating the shutter 27.

[0027] According to a preferred embodiment of the invention, seat 31 coincides with a spherical concavity formed into the lower block 30 which serves to receive a corresponding profile 32 similarly of spherical convex form which protrudes from the lower part of the shutter 27.

[0028] The upper half-casing 19 is perforated by an aperture 33 for the passage of the actuation means 28 of the shutter 27, which are essentially composed of a vertical stud 34, centred and extending upwards from the shutter 27, and which is rotationally integral with the latter. The length of the stud 34 is such as to make an upper section thereof protrude from the upper half-casing 19 through the aperture 33; the actuating means 28 also includes a first pinion 35 fitted to the said upper section of the stud 34 and rotationally constrained thereto, and a transmission and connection assembly 36 between the said first pinion 35 and the controls 13 located externally to the said base plate 2.

[0029] Such controls means 13 are preferably located on the upper handle 6, conveniently on the front part thereof, and the transmission unit 36 comprises a shaft 37 supported substantially vertically between the base plate 2 and upper handle 6, freely rotatable around its own longitudinal axis, and a pair of respective second pinions 38 and 39 fitted to the upper and lower ends of the shaft 37.

[0030] A gear wheel 40 is mounted to the upper handle 6, and is rotatably actuated by the user; both the first pinion 35 and the gear wheel 40 can engage with the second lower pinion 38 and upper pinion 39.

[0031] Along the second duct 23, inside the base plate 2 and immediately upline of the selection means 12, a valve 41 is positioned, preferably of the type with only two positions, open and closed, operable with a specific

control, for example a second switch coupled to the already mentioned control 7, located on the upper handle 6 and serving to enable/disable the delivery of steam to the means of selection 12.

[0032] The operation of the steam iron 1 according to the invention is as follows: via duct 8, when the user requests steam by actuating switch 7 for usual ejection through the first set of holes 5, the steam generated by the provided generator is delivered first to the internal steam chamber 4 and then issues in pulsed jets as required by the user from the said first set of holes 5.

[0033] When the user wishes to use the second set of holes 9, or the third front hole 10 or the fourth pair of side holes 11, he first selects the position of the shutter 27 in such a way that one or both of the through holes 127 and 227 align with the second slot 24 (figure 4a) for ejection via the third front hole 10, with the third pair of slots 25 (figure 4b) for ejection via the holes 11, with the fourth slot 26 (figure 4c) for ejection via the second set of holes 9.

[0034] Once the selection has been made, the user actuates a second switch, preferably located in combination with the said switch 7, to request steam from the generator. In this case the steam is conveyed into the second duct 23, independent of duct 8, and valve 41, normally closed, opens to allow the steam to pass to the selection means 12 and to the hole or holes selected.

[0035] It is noted that this such possibility to divide the flow of steam between independent ducts 8 and 23 allows the iron to supply steam at different temperatures and ready for use, by simply setting the delivery device for this purpose.

[0036] Practice has shown that the invention does in fact achieve the intended purposes.

[0037] The invention as described herein is susceptible of modifications and variations all falling within the scope of this patent as defined in the following claims.

[0038] Furthermore, all detailed parts may be replaced by other equivalents and the materials used, as well as the forms and dimensions, can be varied as desired to meet specific requirements.

Claims

1. A professional and semi-professional steam iron comprising a base plate (2) having a lower ironing surface (3), an internal steam chamber (4), and a downwards-oriented first set of steam ejection holes (5) connected with the internal steam chamber (4), an upper handle (6) fixed to the base plate (2) and provided with a control mean (7) which activates the pulsed ejection of steam from said first set of holes (5), a duct (8) which conveys the steam from the generator to the said internal steam chamber (4), **characterised in that** said base plate (2) further comprises: at least one second set of steam ejection holes (9) oriented downwards, independent

of the first set (5), and connected to said generator, at least one third front steam ejection hole (10) substantially located at the tip of the said base plate (2) and connected to said generator, at least one fourth pair of steam ejection holes (11) located one on either side of the third front ejection hole (10) on the front sides of the base plate (2) and connected with said generator, selection means (12) for selecting the ejection of steam from said second set of holes (9) and/or from said third front hole (10) and/or from said fourth pair of side ejection holes (11), controls means (13) for controlling said selection means of selection (12) located externally of said base plate (2), and second conveyance means for converging the steam from said generator to said selection means (12).

2. Iron as claimed in claim 1, **characterised in that** said second set of holes (9), third front hole (10) and fourth pair of side holes (11) are connected to the said selection means (12) with respective independent ducts (15, 16, 17).
3. Iron as claimed in claims 1 and 2, **characterised in that** said selection means (12) include: a box-form casing (18) having an upper half-casing (19) and a lower half-casing (20), which can be fixed to each other; a first intake slot machined into the upper half-casing (19), coupling to said second conveyance means; a second slot (24), two third slots (25) and a fourth slot (26) formed into the lower half-casing 20 and connected with respective independent ducts (15, 16, 17) to said third front hole (10), said fourth pair of side holes (11) and said second set of holes (9); a shutter (27) which alternately opens said second slot (24), said pair of third slots (25) and said fourth slot (26), rotatably mounted tightly inside said box-form casing (18); rotatable actuation means (28) for actuating said shutter (27) operable from the exterior of the said base plate (2).
4. Iron as claimed in claim 3, **characterised in that** said second (24), said third (25) and said fourth (26) slots are disposed in the said lower half-casing (20) along a first circular generating line (200) oriented substantially in the horizontal plane.
5. Iron as claimed in claims 3 and 4, **characterised in that** said second slot (24) is mounted symmetrically between the said two third slots (25) and diametrically opposite said fourth slot (26).
6. Iron as claimed in claims 3, 4, 5, **characterised in that** said third slots (25) are spaced by a first circumferential arc of predetermined amplitude (x).
7. Iron as claimed in any one of claims 3 to 6, **characterised in that** said second (24) and said two third

(25) slots are oriented towards the front of the said iron (1).

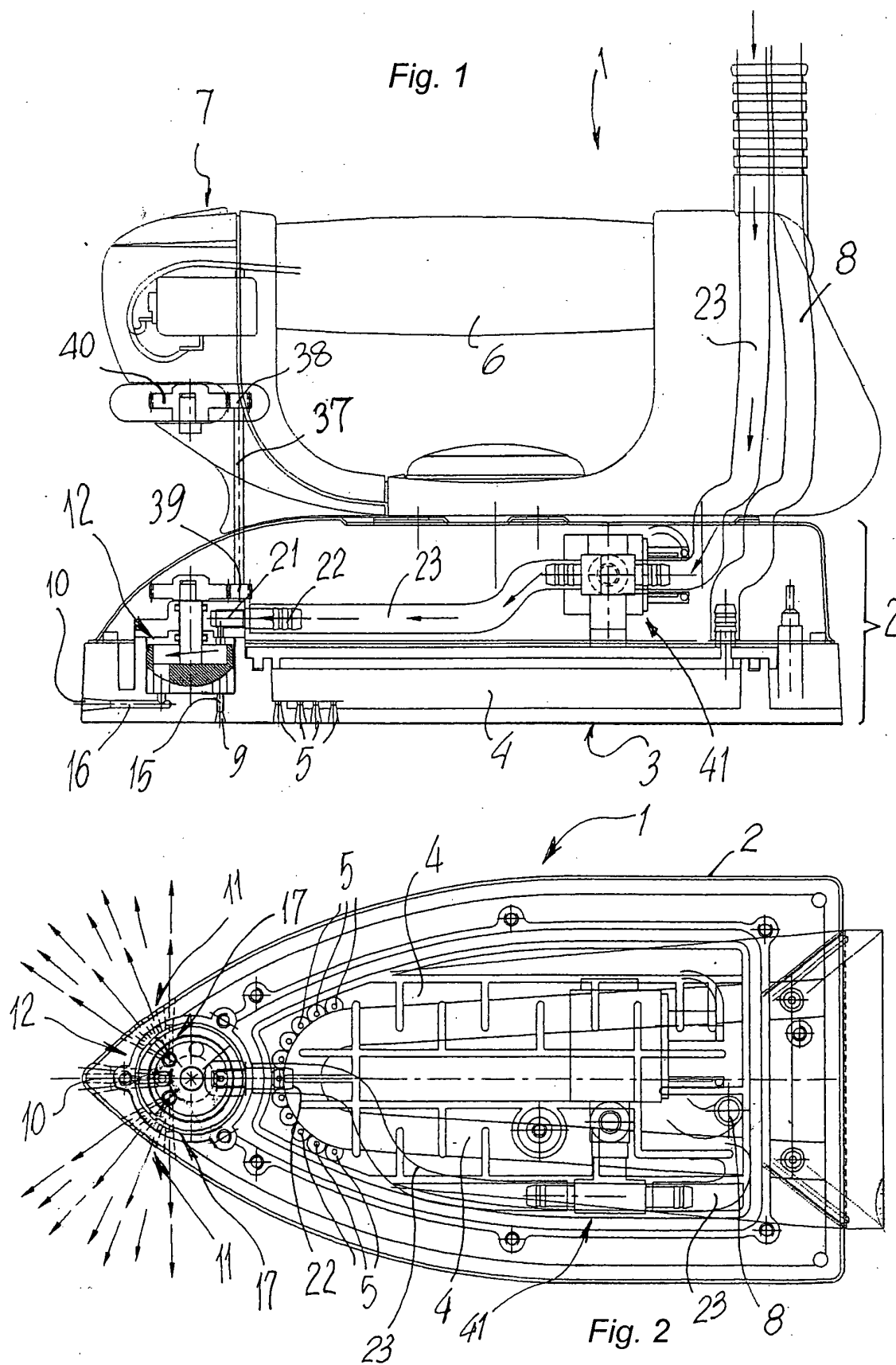
8. Iron as claimed in any one of claims 3 to 7, **characterised in that** said shutter (27) is perforated by at least one pair of fifth through holes (127, 227) disposed according to a second circular generating line (201) oriented substantially horizontally with a radius equal to that of the said first generating line (200) and concentrically superimposed thereon, said pair of fifth through holes (127, 227) being spaced by a second circumferential arc of amplitude (y) equal to said first (x). 5
9. Iron as claimed in any one of claims 3 to 8, **characterised in that** the holes (127, 227) of said pair of fifth through holes can be aligned vertically by superimposition with both said third slots (25), and singly with the said second (24) or said fourth (26) slot, by rotating said shutter (27). 10 15
10. Iron as claimed in claim 3, **characterised in that** between said upper (19) and said lower (20) half-casings and said shutter (27) are interposed low friction devices. 20 25
11. Iron as claimed in claim 10, **characterised in that** said low friction devices comprise at least two blocks (29, 30), superimposed and coaxial, integral with a respective upper (19) and lower (20) half-casings and defining in combination a seat (31) for the rotatable location of said shutter (27). 30
12. Iron as claimed in claim 11, **characterised in that** at least said lower plate (20) defines a half seat of spherical shape for housing a corresponding semispherical convex profile (32) protruding below said shutter (27), said concave half-seat being correspondingly perforated by said second (24), said third (25) and said fourth (26) slots. 35 40
13. Iron as claimed in claim 3, **characterised in that** said upper half-casing (19) is vertically perforated by an aperture (33) for the passage of the said means of actuation (28) of the said shutter (27). 45
14. Iron as claimed in any one of claims 3 to 13, **characterised in that** said actuating means (28) of said shutter (27) comprise: an upward stud (34) protruding upwards and centred relative to said shutter (27), and rotationally fixed thereto, and protruding for an upper section beyond said upper half-casing (20) via said aperture (33); at least one pinion (35) fitted to the said upper section and rotationally integral therewith; and a transmission and connection assembly (36) of said first pinion (35) to said control means (28) located externally of said base plate (2). 50 55

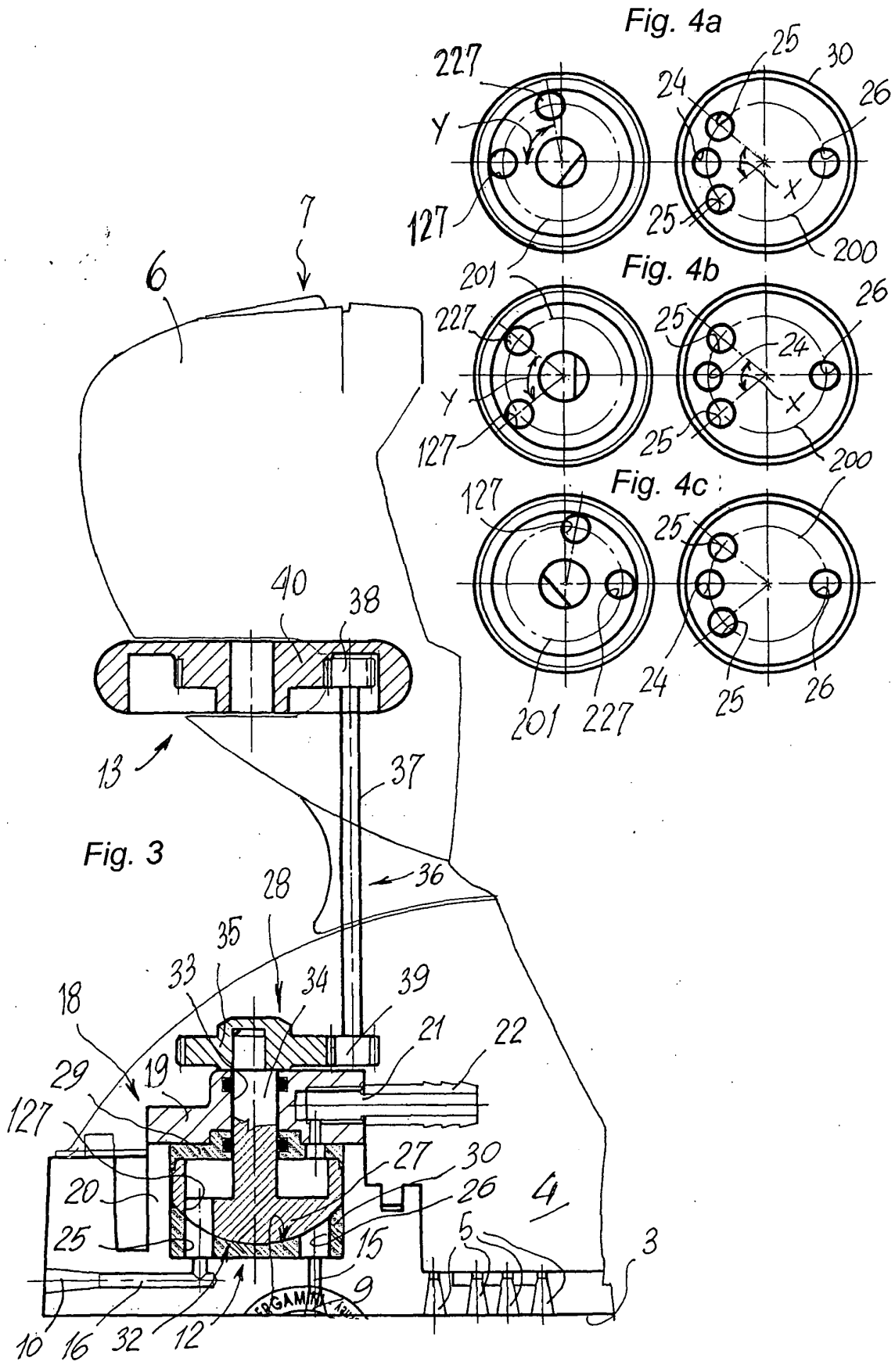
15. Iron as claimed in claims 1 and 14, **characterised in that** said control means (28) are located on said upper handle (6).

16. Iron as claimed in claims 14 and 15, **characterised in that** said transmission assembly (36) comprises: at least one shaft (37) supported substantially vertically between said base plate (2) and said upper handle (6); a pair of respective second pinions (38, 39) mounted to the upper and lower ends of said shaft (36); a gear wheel (40) mounted to the said upper handle (6) and actuatable by rotation, said first pinion (35) and said gear wheel (40) being engageable correspondingly with the said second lower and upper pinions (38, 39).

17. Iron as claimed in claim 1, **characterised in that** said second conveyance means of the steam are independent of the said duct.

18. Iron as claimed in claims 1 and 17, **characterised in that** said second conveyance means comprise: a second duct (23) connecting said generator with said selection means (12); at least one valve (41) of the on-off type, housed internally in said base plate (2), interposed between said generator and said selection means (12) and operable by a control means located on the upper handle (6).







European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 01 2405

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)
A	US 2 425 598 A (WALTER CLUM HENRY) 12 August 1947 (1947-08-12) * column 1, line 32 - column 2, line 22 * * column 2, line 43 - column 3, line 5 * * column 3, line 70 - column 4, line 42 * * figures 1-9 * ---	1-18	D06F75/12 D06F75/20
A	EP 1 239 071 A (ESSE 85 S R L) 11 September 2002 (2002-09-11) * paragraph [0024] - paragraph [0056] * * figures 1-7 * ---	1-18	
A	EP 1 178 147 A (EUGSTER FRISMAG AG) 6 February 2002 (2002-02-06) * paragraphs [0004]-[0012],[0015] * * figures 1-5 * ---	1	
A	US 5 979 089 A (BOULEAU JEAN-PAUL ANGE ANDRE ET AL) 9 November 1999 (1999-11-09) * column 2, line 37 - column 3, line 5 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			D06F
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 30 October 2003	Examiner Weinberg, E
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 03.02 (P04C01)

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

EP 03 01 2405

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.

30-10-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2425598	A	12-08-1947	NONE	
EP 1239071	A	11-09-2002	IT VR20010016 U1 EP 1239071 A1	09-09-2002 11-09-2002
EP 1178147	A	06-02-2002	DE 20013529 U1 EP 1178147 A2	19-10-2000 06-02-2002
US 5979089	A	09-11-1999	FR 2740787 A1 AU 716301 B2 AU 7498396 A CA 2233252 A1 CN 1205752 A ,B DE 69611731 D1 DE 69611731 T2 EP 0858525 A1 ES 2155629 T3 WO 9717487 A1 JP 2000500034 T RU 2167229 C2 TR 9800774 T2	09-05-1997 24-02-2000 29-05-1997 15-05-1997 20-01-1999 08-03-2001 02-08-2001 19-08-1998 16-05-2001 15-05-1997 11-01-2000 20-05-2001 21-07-1998