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(54) Brush for cleaning surfaces

(57) A brush for cleaning surfaces, of the type comprising a housing body (1) whereon a sleeve (2) converges for the engagement with a grip system and wherein a cleaning cloth (9) is arranged, provides that the cloth is of a length greater than the useful length of the brush body and that it is partly wound on two opposite drawing cylinders, said cylinders being rotatably retained on two opposite sides of the brush body (1). The brush further comprises a pedal-controlled transmission device apt to draw in rotation at least one of said drawing cylinders.

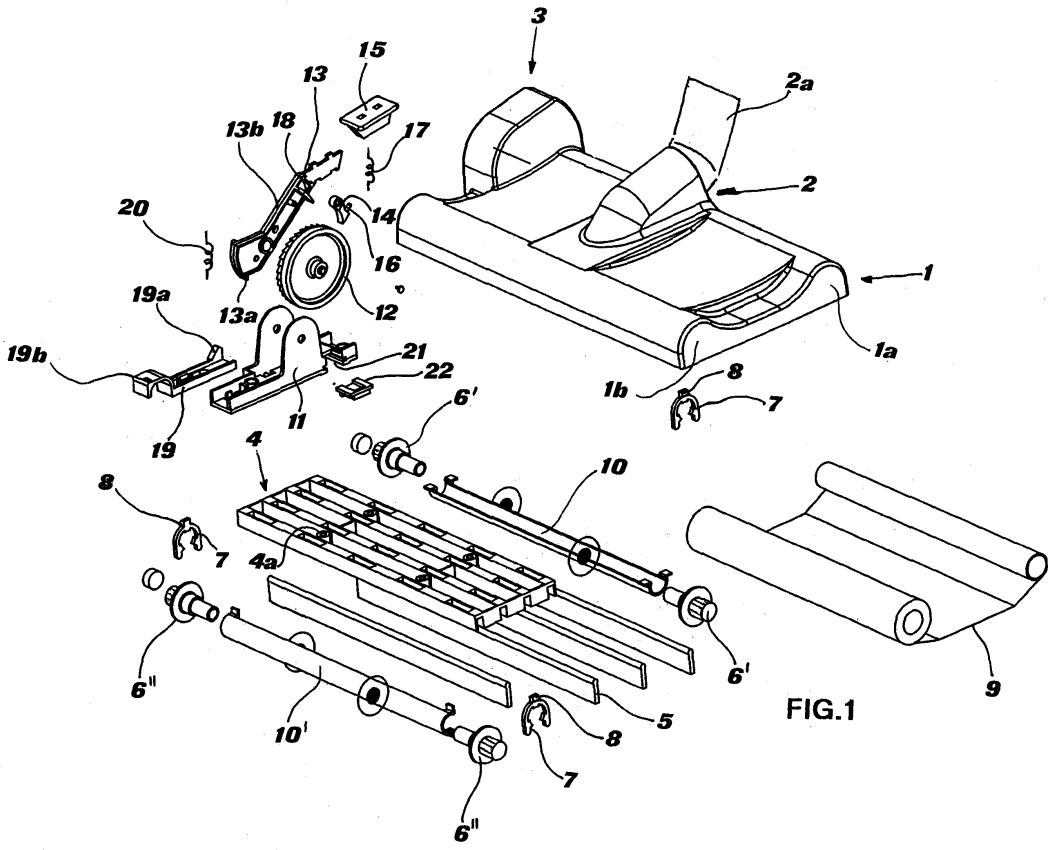

FIG.1

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Description

[0001] The present invention relates to a brush for cleaning surfaces such as floors and walls, in particular to a brush designed to be used on electric appliances equipped with a steam generator.

[0002] Electric appliances for cleaning walls and floors exist on the market, which employ steam to aid full and hygienic cleaning of the surfaces to be cleaned. In particular, this type of electric appliance allows to clean surfaces leaving walls virtually dry at the end of the cleaning operations, and to achieve full cleaning with relatively little effort.

[0003] This type of electric appliance normally consists of a body containing a steam generator, from which a variously-shaped pipe departs, according to requirements, at the end of which a brush is arranged for contact with the surface to be cleaned.

[0004] This brush normally consists of a virtually flat base surface, surmounted by a cover, and of a seat for the engagement of a pipe connecting said brush with the generator.

[0005] It is usually provided to place on the base surface a cloth which will be moistened by steam, whereon the dust or dirt found on the surface to be cleaned collects. For the fastening of the cloth to the base surface, various devices have been employed: in some cases the cloth itself is fastened, providing a hemming of an elastic material apt to fully cover the base surface and part of the cover, in other cases it is preferred to employ clip-on or engagement structures found on the cover. In both cases, the operator is then forced to remove the cloth at the end of the cleaning operations, or when the cloth appears to be excessively soiled.

[0006] As can be easily understood, this operation is particularly annoying, as well as being non-hygienic, and implies the waste of a substantial amount of time, even more so if the operator has to wash particularly vast or extremely dirty surfaces, for which this type of operation is required relatively often.

[0007] It is hence an object of the present invention to solve the cited drawbacks, in particular to provide a brush for cleaning surfaces which allows to dramatically reduce the frequency with which it is necessary to replace the collection cloth.

[0008] This object is achieved by means of a brush as described in its essential features in claim 1).

[0009] The dependent claims concern some preferred features of the invention.

[0010] In order to better understand the invention and the features thereof, reference will now be made to a particularly preferred embodiment of the invention as it is shown in the accompanying drawings, wherein:

[0011] fig. 1 is an exploded view of the brush according to the invention, with some parts removed;

[0012] fig. 2 is a top plan view of the brush according to the invention;

[0013] fig. 3 is an elevation rear view of the brush according to the invention;

[0014] fig. 4 is an elevation front view of the brush according to the invention;

[0015] fig. 5 is a cross-section view taken along the line A-A of fig. 2; and

[0016] fig. 6 is a bottom plan view of the brush according to the invention.

[0017] The brush consists of a suitably shaped, main housing body 1, which provides in particular an inclined sleeve 2, on the central portion thereof, and a side casing 3.

[0018] Sleeve 2 is intended for the introduction of an elbow pipe coupling (2a) for free-rotation connection with the pipe sucking and/or dispensing the steam coming from the generator.

[0019] Within housing body 1, some functional members described in detail in the following are provided.

[0020] A grid 4 is applied underneath body 1 by way of fastening means introduced in suitable seats 4a, and houses straps 5 of an elastic material, for example rubber.

[0021] Straps 5, as can be clearly seen in fig. 5, are suitably shaped to fit tightly in rectilinear guides 5a of grid 4.

[0022] In front of and behind grid 4, two drawing cylinders are provided, arranged parallel to the longest side of body 1 and housed in respective curved fairings 1a and 1b of body 1. Such cylinders, not shown for the sake of drawing clarity, are mounted on respective pairs of support end pieces 6' and 6".

[0023] Each of these end pieces 6' and 6" consists of a flanged cylindrical body, an end of which is apt to engage securely with a corresponding end of the drawing cylinder; the opposite end is equipped with a circumferential crown gear, the usefulness of which will be apparent further on.

[0024] Sealing forks 7, equipped with an engagement notch 8, are finally provided. By means of said notch, sealing forks 7 are made integral with a respective seat of housing body 1. These forks are apt to retain, freely pivoting in rotation, end-pieces 6' and 6".

[0025] The forks are shaped so as to be able to elastically clip open and close upon introduction of end-pieces 6' and 6" ; the elasticity inherent in these forks also allows to remove the same end-pieces 6' and 6" imparting a traction action on the drawing cylinders. This construction, as will be clearer in the following, allows the effortless application and replacement of cloth 9.

[0026] According to the embodiment shown, forks 7 are provided on the two sides of the front cylinder and on one side only of the rear cylinder: on the side of the transmission device, as will be clearer further on, end-piece 6" does not require a fork-equipped support.

[0027] The drawing cylinders are apt to retain and wind on themselves the opposite edges of a cleaning cloth 9, which stretches between the two cylinders running over the outer edges of straps 5. The ends of the two edges of cloth 9 are suitably locked on the drawing cylinders by

easily-removable fastening means; for example, these fastening means are in the shape of elongated, semicircular bent tiles 10' and 10" having a shape matching the outer profile of the drawing cylinders and elastically deformable so as to be able to be clipped on top of the cloth edge and to retain it on the respective cylinder.

[0028] Within casing 3 a transmission device is installed for the controlled rotation of the drawing cylinders and hence for cloth sliding.

[0029] The transmission device comprises a U-shaped support bracket 11, along the vertical walls of which two holes of engagement are obtained for a shaft of a toothed wheel 12 having double toothing: on the innermost side, a normal gear toothing, on the outer side instead, a saw-tooth profile. Thereby, double engagement is guaranteed: inside, engagement is provided with the notches of support end-pieces 6', 6" , outside, with a ratchet described below.

[0030] On the same axis of rotation of wheel 12, but independent from said wheel, an operation lever 13 is also mounted oscillating and equipped, on the one hand, with an engaging pawl 14 and, on the other, with a manoeuvring notch 13a.

[0031] The upper end 13b of lever 13 comes out of casing 3 and is equipped with a pedal member 15 by which the operator can intervene, for example with a foot, to perform the rotation of lever 13.

[0032] Engaging pawl 14 consists of a notch body, apt to engage with the saw-tooth profile of toothed wheel 12, mounted oscillating on lever 13. On the opposite side to toothed wheel 12, the pawl has a pin 16 to introduce a spring 17. On the other side, the spring rests in opposition to a stopping plate 18 protruding from lever 13.

[0033] Pawl 14 is mounted free to rotate on lever 13, therefore the arrangement of the spring allows to keep pawl 14 pushed towards toothed wheel 12: the engagement of the notched body with the saw-tooth toothing of wheel 12 allows to make the lever rotation integral with wheel 12 during the active run of the lever (anticlockwise direction in fig. 5), allowing at the same time lever return (clockwise direction in fig. 5), idle with respect to wheel 12.

[0034] Manoeuvring notch 13a of lever 13, which protrudes from the base of the lever, is apt to engage with a corresponding shoulder 19a of a retaining cursor 19, which is housed in the U-shaped bracket 11, the features of which will be described in the following.

[0035] In order to allow recalling of the lever into the home position, i.e. the position shown in the pictures, a spring 20 is provided fastened, at one end thereof, to a pin protruding from the lever and, at the other end, to a pin provided within bracket 11.

[0036] Bracket 11 further has a plinth lower portion which acts as a cover of the device towards the outside of bush 1, as well as a guide for retaining cursor 19.

[0037] As is clearly visible in the drawings, cursor 19 has a main saddle body equipped, at one inner end, with the opposing shoulder 19a and, at the outer end, with a hook 19b.

[0038] Said hook 19b is shaped so as to cover the upper surface of the support end-piece and has an engaging end notch, apt to engage with the toothed wheel of the corresponding support end-piece 6".

[0039] A push spring (not shown) is further provided behind the cursor, which keeps the cursor pushed forward, i.e. disengaged from the toothed wheel of the corresponding end-piece 6''.

[0040] Preferably, in order to aid mounting of the rear cylinder, a cutout 21 is provided on the base side of casing 3, into which cutout the end of end-piece 6' of the cylinder can be introduced to then bring it into engagement with the gear part of toothed wheel 12. Once end-piece 6' has been introduced, the cutout is closed by a cover 22 which is pushed into a closed position by a spring. This allows secure locking of end-piece 6' in the area of engagement with toothed wheel 12.

[0041] The working of the brush device thus accomplished is relatively simple. After the cloth has been arranged on the two cylinders, and has then been fastened thereon by the fastening bent tiles 10', 10", the two cylinders are brought into the suitable recesses arranged within support body 1 and they are subsequently made integral with body 1 by securing them to forks 7. The cloth thereby appears taut and - fig. 6 - resting on straps 5.

[0042] The brush is thus ready for use. After having engaged with pipe coupling 2a of sleeve 2 the pipe coming from the suitable electric appliance, the operator can begin to clean the desired surfaces.

[0043] Once the cloth has become unusable, the operator pushes the pedal, acting on the lever associated therewith and hence causing the rotation of toothed wheel 12, with which it is made integral by the pawl. Rotation of wheel 12, typically by an angle of about 45°, in turn causes the rotation of end-piece 6', and consequently the rotation of the rear drawing cylinder and of cloth 9 fastened thereto. At the same time, lever 13 disengages notch 13a from cursor 16 which consequently, under the action of the respective spring, translates forward freeing up respective end-piece 6" : thereby, also the front cylinder is free to rotate and hence to correspondingly unwind cloth 9.

[0044] Once the end-stop has been reached, the operator releases pedal 15, determining the consequent return in position of lever 13, which this time occurs with a loadless run, i.e. without imparting any rotation to wheel 12. At the end of the run, retaining notch 13a brings back cursor 16, overcoming the reaction of the respective elastic spring, so as to lock again end-piece 6" and prevent a further free unwinding of cloth 9: thereby, cloth tension is adequately maintained, also during cleaning operations.

[0045] When the cloth has been fully used up, i.e. it has been fully unwound from one cylinder to the other, it is possible to disassemble the two cylinders, turn over the cloth and mount it back on with the two cylinders in an inverted position, so as to use the other cloth surface,

too.

[0046] The above-reported description is referred to a particularly preferred embodiment. Various other embodiments are possible which do not depart in any way from the scope of the invention.

[0047] In particular, it can be easily understood that pipe coupling 2a can be arranged for the engagement with any type of surface-cleaning apparatus, without special devices being required. Therefore, the brush according to the invention is not limited to the field of electric steam appliances, but can similarly be used on other types of electric appliances or also to a simple grip rod which allows to use the brush of the invention with no further apparatus.

[0048] Moreover, straps 5 can consist of any material considered suitable, such as for example a plastic material which has sufficient elastic and heat-withstanding properties, or they can even be replaced by bristles, in case it is desirable to clean soft or in any case delicate surfaces.

[0049] Similarly, it is possible to provide to add quickly releasable, suitably narrow linear brushes at the ends of body 1, to ease the operations of waste material removal. These brushes can be made of bristles or, like more modern brushes, of rubber.

[0050] Of course, the invention works with any type of cloth available on the market, such as for example fabric or microfibre, without any drawbacks being foreseeable, provided the selected materials are suitable for steam cleaning.

[0051] Again, the mounting and quick-release system of the cylinders from housing body 1 can be conceived differently. The reported forks 7 have been identified as the preferred system, especially in terms of inexpensiveness, but it is not excluded that the main principle provided here can be achieved by other embodiments.

[0052] Many others can be the alternative embodiments of the present invention, which in any case fall within the scope of the claims.

Claims

1. Brush for surface cleaning, of the type comprising a housing body (1) whereon a sleeve (2) for the engagement of a grip system converges and wherein a cleaning cloth (9) is arranged, **characterised in that** said cloth is of a greater length than the useful length of the brush body and is partly wound on two opposite drawing cylinders, said cylinders being rotatably retained on two opposite sides of the brush body (1), and **in that** it further comprises a transmission device which may be actuated by a pedal-controlled actuating lever capable of drawing in rotation at least one of said drawing cylinders.

2. Brush as claimed in claim 1), **characterised in that** said transmission device has stopping means capable of stopping the rotation of at least one of said drawing cylinders.

3. Brush as claimed in claim 1) or 2), **characterised in that** said transmission device comprises a toothed wheel (12) equipped with a gear toothing which can be meshed with one of said drawing cylinders and equipped with a saw-tooth toothing which can be engaged with a ratchet integral with said pedal-controlled actuating lever (13), said ratchet making the rotation of the actuating lever (13) integral with said toothed wheel (12) only during an active run of the lever and not during the return run thereof.

4. Brush as claimed in claim 3), wherein said lever (13) is pushed into a home position by spring means (20).

5. Brush as claimed in claim 3) or 4), wherein said ratchet consists of an engaging pawl (14) mounted oscillating on said actuating lever (13) and maintained engaged with said saw-tooth toothing by a spring (17).

6. Brush as claimed in any one of the preceding claims, wherein said transmission device further has a cursor (19) capable of intercepting at least one of said drawing cylinders stopping the rotation thereof, elastic push means being further provided which push said cursor out of the intercepting position of engagement with said at least one cylinder, and wherein said actuating lever (13) further has a manoeuvring notch (13a) capable of engaging with said cursor (19) in the home position of said lever (13), so as to push it into an intercepting position in opposition to said elastic push means.

7. Brush as claimed in claim 6), wherein said cursor (19) consists of a saddle body from which a tooth (19a) protrudes, engageable with said manoeuvring notch (13a), and wherefrom a bridge portion (19b) extends, capable of passing over said drawing cylinder and equipped, at the end thereof, with an end-engaging notch capable of intercepting a toothed profile integral with said at least one drawing cylinder.

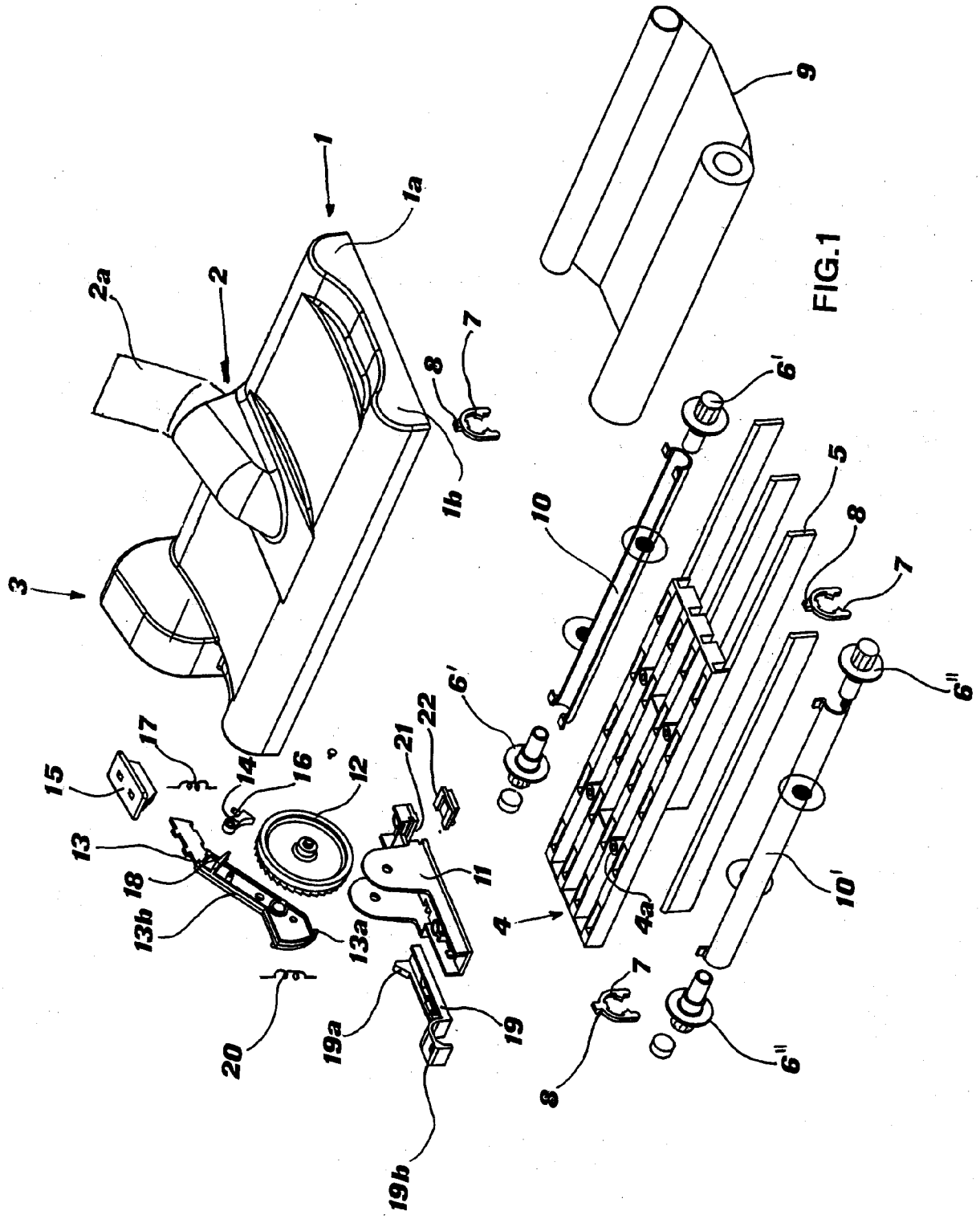
8. Brush as claimed in any one of the preceding claims, **characterised in that** means (7) are provided for the support and the quick fastening/release of said drawing cylinders to/from housing body (1), said means being mounted in a respective seat of the housing body (1), and capable of retaining, freely pivoting -in rotation, end pieces (6', 6") of said drawing cylinders.

9. Brush as claimed in claim 8), **characterised in that** said support and quick fastening/release means (7) are in the shape of elastic forks.

10. Brush as claimed in any one of the preceding claims, **characterised in that** a grid (4) is provided on the lower part of housing body (1), applied thereto by fastening means introduced in suitable seats (4a), which grid houses elongated straps (5) made of an elastic and heat-withstanding material.

11. Brush as claimed in any one of the preceding claims, **characterised in that** said brush is intended for the coupling with an electric steam appliance, said sleeve (2) comprising a steam supply pipe.

12. Electric steam appliance for surface cleaning, of the type comprising at least a steam generator and a pipe supplying steam to brush means, **characterised in that** said brush means are as in any one of the preceding claims.


1
1a
1b
2
2a
3
4
4a
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6'
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6'''
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9
10
10'
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12
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13a
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FIG.1

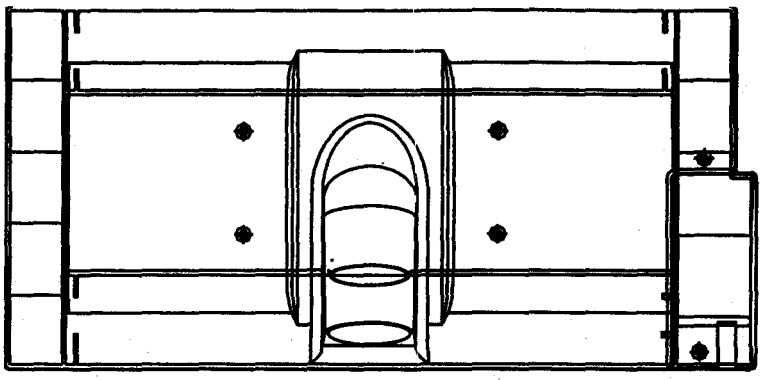

FIG.2

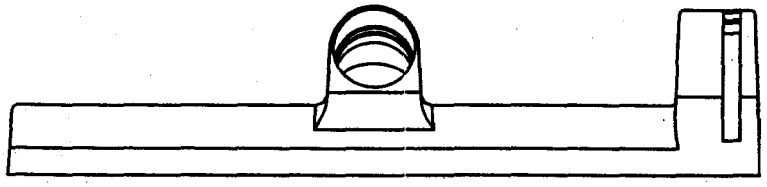

FIG.3

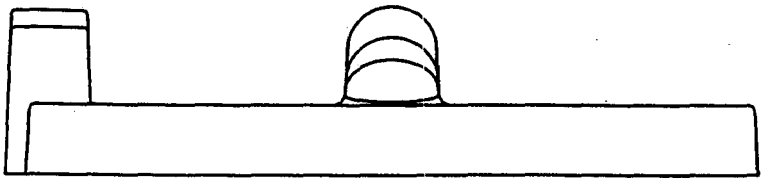

FIG.4

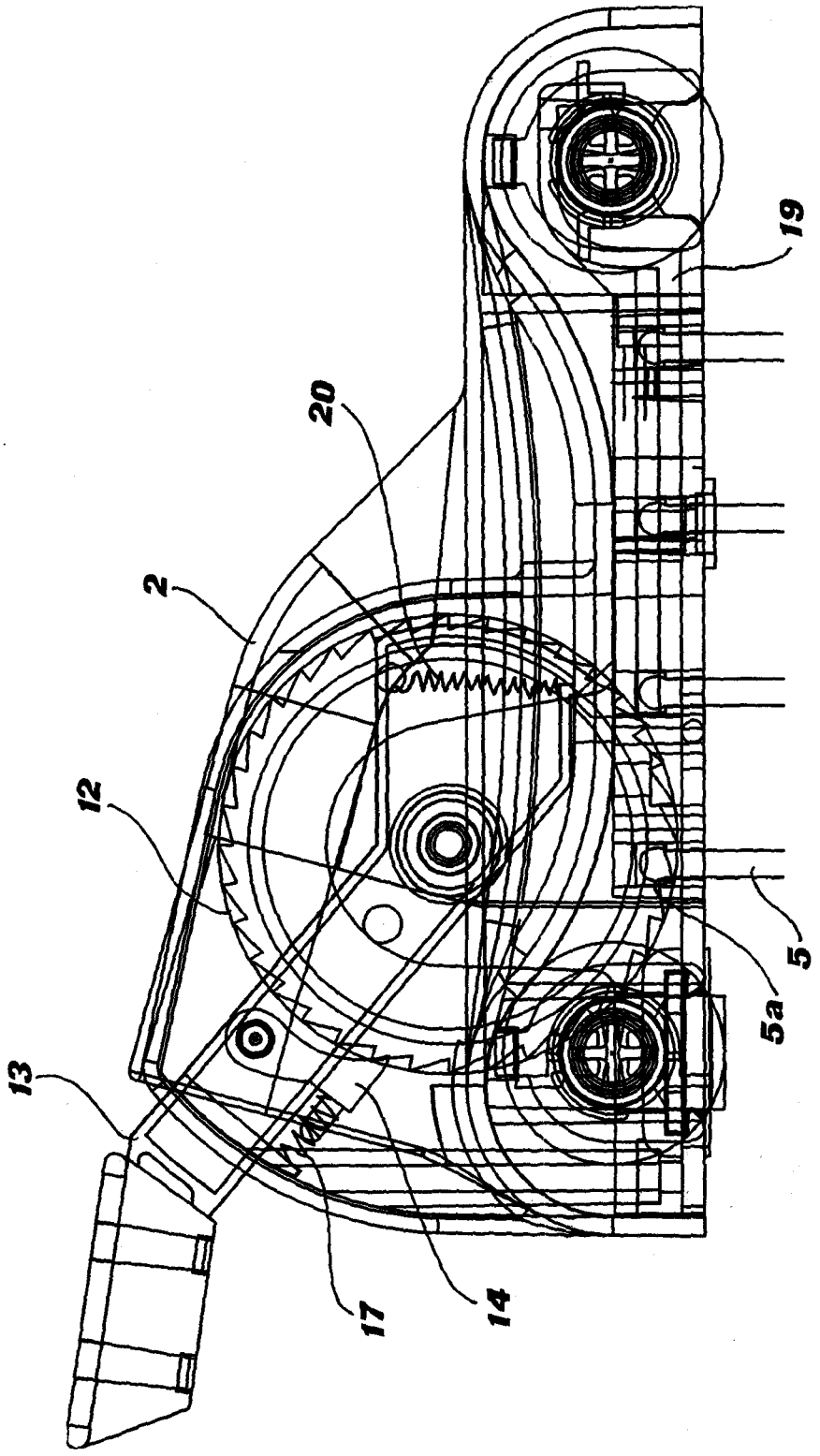

FIG.5

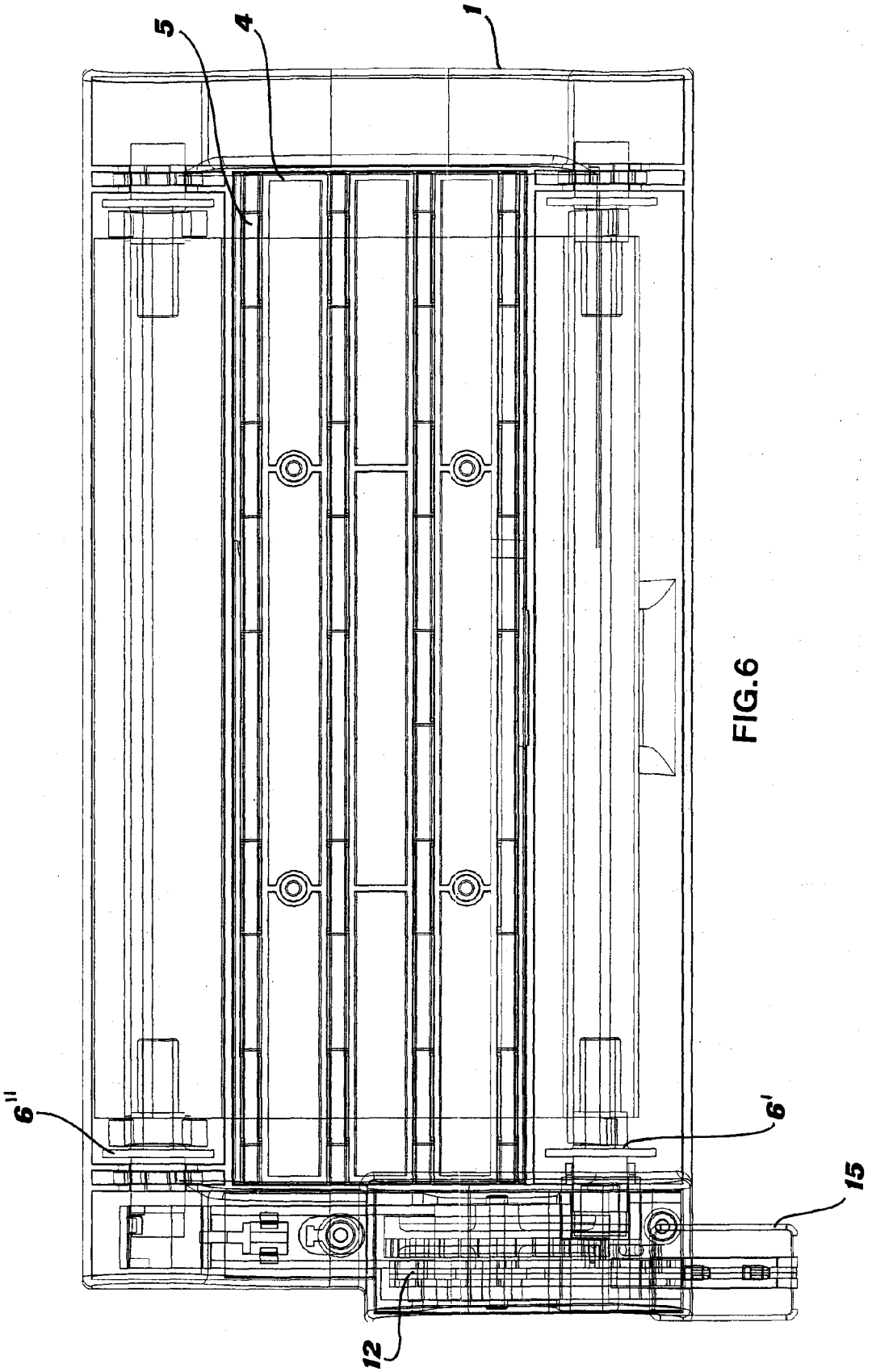

FIG.6

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EUROPEAN SEARCH REPORT

Application Number
EP 06 11 1017

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 February 2007	Özsoy, Sevda

CATEGORY OF CITED DOCUMENTS

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