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

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

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

(54) **Method for a treatment of ironing and similar of clothing articles, particularly uncreased-style trousers and corresponding apparatus**

(57) The invention relates to a method and an apparatus for a treatment of ironing and similar clothing articles, particularly uncreased-style trousers, by using a plurality of working heads (11-18) maintained stationary arranged to act on clothing articles while they are

maintained in a plurality of grip elements (21), the grip elements being moveable with respect to the plurality of working heads in order to successively have each clothing article under each working head of the plurality of working heads for treating thereby.

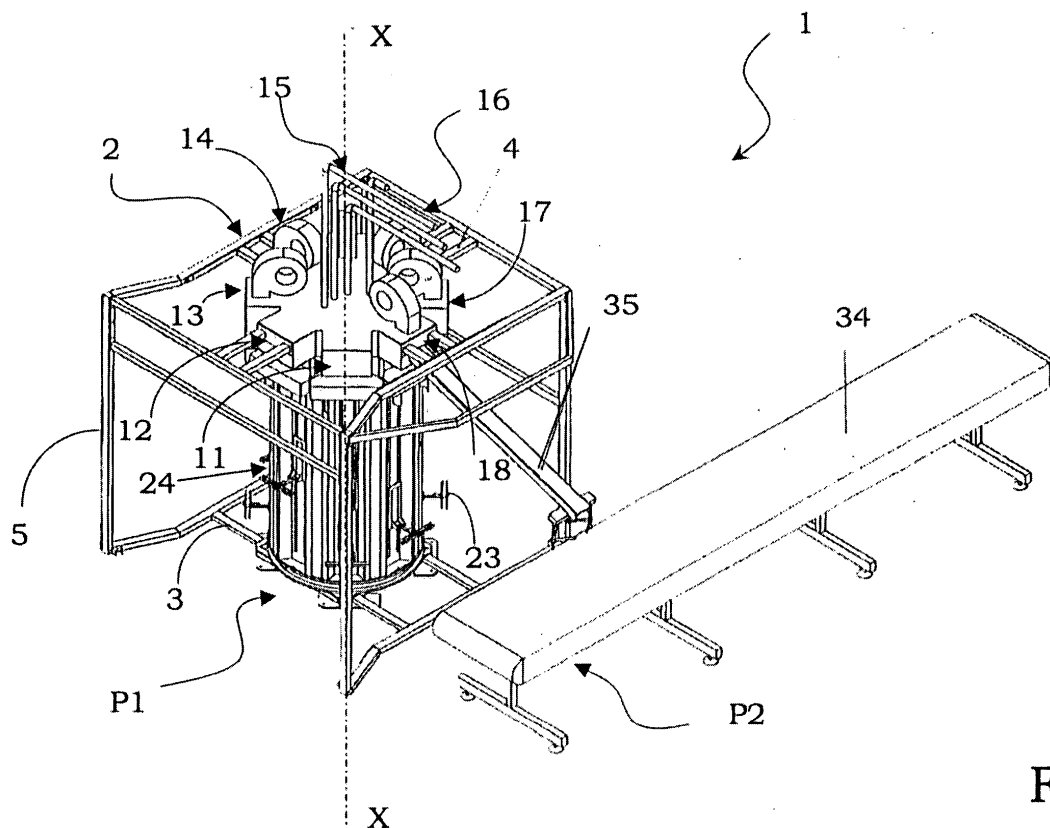


FIG. 1

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Description

Field of Application

[0001] The present invention relates to a method for a treatment of ironing and similar clothing articles, particularly uncreased-style trousers.

[0002] Specifically, the invention relates to a method for a treatment of ironing and similar clothing articles, particularly uncreased-style trousers, by means of a plurality of treating heads active on said clothing articles, these being held by a plurality of grip elements.

[0003] The invention further relates to an apparatus for a treatment of ironing and similar clothing articles, particularly uncreased-style trousers, of the type comprising a plurality of working heads and a plurality of gripp elements of the article to be treated.

[0004] Although not limited to, the invention relates to a method of ironing through blowing and steaming uncreased-style trousers and the following description of this field of application is given for convenience of explanation only.

Prior Art

[0005] As it is well known, clothing article treatment, particularly uncreased-style trouser ironing, is industrially performed by means of proper machines that are equipped with working heads operative to discharge steam on the articles.

[0006] Conventional ironing machines also comprise grip elements or grippers holding clothing articles positioned at a working head.

[0007] In particular, an operator loads a clothing article in the grippers, and remove the clothing article by release of the grippers at the end of the ironing treatment.

[0008] In order to increase the number of articles treated per time unit, it is also known to provide a system for treating clothing articles with a plurality of treating machines controlled by an operator, who loads a clothing article on a machine, while another clothing article is being treated by another machine, and then unloaded once the ironing treatment is ended, in such a way as to minimize waiting times.

[0009] However, such a treating system is not little automated, because it depends on the operator's ability to load and unload quickly the clothing articles on/down the machines.

[0010] A system has also been suggested wherein a plurality of machines, each including a working head and grippers, are installed on a turntable type of structure.

[0011] A single operator loads a clothing article to be treated on the grippers of a machine when this one passes for treating by the machine as the latter moves past him, and the treated article is then picked up by some automated means. During the turntable rotation, the

clothing article moves from a loading station to an unloading station through a number of other stations where it can be treated as desired.

[0012] This prior construction, although advantageous on several counts, especially in that it allows a higher degree of automation, is made complicated by the orbiting machines either involving the provision of steam generators to serve each machine individually, or of elaborate and expensive rotary pipe connections between the machines and a common steam generator.

[0013] The underlying technical problem of this invention is to provide a method and an apparatus for ironing clothing articles, particularly uncreased-style trousers, which while meeting all of the treating requirements, can overcome the limitations that beset prior arrangements.

Summary of the invention

[0014] The resolution idea on which this invention stands is one of providing for the clothing articles to be moved around and the working heads held stationary for treating the articles.

[0015] Based on the above idea, the technical problem is solved by a method for a treatment of ironing and similar clothing articles, particularly uncreased-style trousers by having a plurality of working heads arranged to act on said clothing articles while they are held in a plurality of grippers, characterized in that it comprises mounting said plurality of grippers on a carousel, and rotating the carousel relative to said plurality of working heads maintained stationary to successively take each said clothing article under each working head of said plurality of working heads for treating.

[0016] The problem is further solved by an apparatus for a treatment of ironing and similar clothing articles, particularly uncreased-style trousers, which apparatus comprises a plurality of working heads and a plurality of grippers in which clothing articles to be treated are gripped, and is characterized in that it comprises a carousel mounted in a support frame and carrying said plurality of grippers, and that the carousel is rotatable relative to said plurality of working heads, which are instead maintained stationary on said frame, thereby to take each said clothing articles in succession under each working head of said plurality of working heads for treating.

[0017] The features and advantages of the method and apparatus according to the invention should become more clearly apparent from the following description of embodiments thereof, given by way of example and not of limitation with reference to the accompanying drawings.

Brief description of the drawings

[0018] In the drawings:

Figure 1 is a schematic perspective view of a cloth-

ing treating apparatus embodying this invention;
and

Figures 2 and 3 are respective longitudinal and
transverse cross-sectional views in perspective of
the apparatus shown in Figure 1.

Detailed description

[0019] With reference to the drawings, in particular to
Figure 1 thereof, an apparatus for ironing clothing arti-
cles, particularly uncreased-style trousers, is shown
generally at 1.

[0020] The apparatus 1 comprises a support frame 2,
which is preferably a metal construction extending be-
tween two opposite decks, specifically a lower or base
deck 3 and an upper deck 4, the decks being connected
rigidly together by peripheral uprights 5.

[0021] The frame 2 has a generally prismatic shape
that grows vertically around a vertical axis XX.

[0022] Mounted fixedly on the upper deck 4 of the
frame 2 are a plurality - eight in the example shown - of
working heads, as follows:

a first head 11 of article loading, i.e. an article load-
ing head;

a second head 12 of steaming and/or blowing, i.e a
steaming and/or blowing head 12;

third, fourth and fifth heads 13, 14 and 15 of steam-
ing and/or blowing, i.e. steaming and/or blowing
heads, which are essentially similar to the second
steaming and/or blowing head 12;

a sixth head 16 of article cooling and stabilizing, i.
e. an article cooling and stabilizing head;

a seventh head 17 of article unloading, i.e. an article
unloading head;

an eighth head 18 of spare loading, i.e. a spare
loading head.

[0023] Preferably, the plurality of working heads are
mounted on the frame 2 in a circular array around a set
vertical axis X-X, at equiangular distances from each
other.

[0024] The steaming and/or blowing heads include
each a steaming assembly and a blowing assembly.
Each head may optionally be provided with a cooling
assembly as well.

[0025] In particular, the steaming assemblies are ad-
vantageously supplied steam from a common steam
generator, not shown in the Figure. The steam generator
is connected to the steaming assemblies by steam sup-
ply lines 6 and an associated header 7, as shown sche-
matically in Figure 2.

[0026] In particular, respective connection lines lead
to the steaming assemblies from the header 7.

[0027] The apparatus 1 also has an air intake line 8
connected to a conventional source, such as a pressu-
rized air source, not shown. The air intake line 8 branch-
es off by a line 9 to a distributor 10 and to a rotary pipe
connector 20. Air supply lines radiate from the distributor
10 to the stationary working heads, the rotary pipe con-
nector 20 being connected to further lines to be de-
scribed.

[0028] In particular, suitable valve means, e.g. gate
valves, generally shown at 7A may be arranged to con-
trol the delivery of steam from the steaming heads, and
to cut it off altogether as the tubular support is rotated
forward one step.

[0029] To hold the trousers for treating, the apparatus
1 of the invention is provided with a plurality of grippers
21, which are all identical and adapted to grip respective
pairs of the trousers being treated. In particular, each
gripper 21 has a respective stretcher 22 appropriate to
grip the trousers at the waist end and a clamp 23 appro-
priate to hold the trousers bottom ends closed, the trou-
sers being thus held in an upright position.

[0030] Said plurality of grippers 21 are mounted on a
carousel that comprises a tubular support 24 having an
axis XX. The tubular support 24 is mounted for pivotal
movement about the axis XX of the frame 2. In particular,
the tubular support 24 bears for pivotal movement on a
bearing block 25, which bearing block is secured within
the uprights 5 on the lower deck 3 of the frame 2 and
reaches upwards just short of the upper deck 4, it being
designed to take the individual grippers 21 under the
working heads. In other words, the combined tubular
support 24 and bearing block 25 define a carousel that
is rotatable relative to the working heads and carries a
plurality of grippers 21.

[0031] The stretcher 22 and clamp 23 of each gripper
21 are supplied air through lines 26 that lead out from
said rotary connection 20.

[0032] As far as the electric power supply is connect-
ed, electric cables 27 are led to the area of the upper
deck 4 and connected to the individual working heads
over a branch strip 27A.

[0033] Power is also supplied to the area of the lower
deck 3 through a rotary connection 28 from which elec-
tric cables 29 radiate to each gripper 21.

[0034] It should be noted that, concentrically with the
bearing block 25, an internal ring gear 30 is attached to
the tubular support 24 for mesh engagement by its teeth
31 with an idler 32, in turn meshing with a drive gear
32A that is keyed onto a shaft 36 of a conventional elec-
tric motor 37, the motor being mounted fixedly to a plate
33 and rotating the tubular support 24 stepwise, as
shown schematically in Figure 3.

[0035] It should be noted that the apparatus 1 of the
invention has a station P1 located near and opposite the
first working head 11 for loading the trousers to be treat-
ed, and has a station P2 near and opposite the eighth

working head 18 for unloading the treated trousers. In the example of Figure 1, the loading station P1 would have human attendance, and the unloading station P2 includes a belt conveyor 34 and a chute 35 mounted to the lower deck 4 and sloping down to the belt conveyor 34.

[0036] The operation of the apparatus 1 in treating trousers articles as desired will now be described.

[0037] At the loading station P1, the trousers are manually loaded, one pair at a time, in the grippers 21, which are maintained stationary therein and the trousers are here treated by the first working head 11.

[0038] On completion of the operation, the tubular support 24 is rotated one step to take the trousers under the second working head for further treating, and so forth to the eighth working head 18, where the final treating of the trousers takes place and the trousers are ultimately removed over the chute 35.

[0039] In operation, the valve means 7A are operated to control the amount of steam being delivered, or to cut off the steam supply as the tubular support is advanced one step.

[0040] The apparatus of this invention has a major advantage in that its construction is simple, since it has a moving portion only in the area devoted to holding the trousers, and is held stationary with its major portion, represented by the working heads.

[0041] A second, not less important advantage of the apparatus of the invention is the unique quality of the trousers product that is achieved by having the trousers treated in a motionless condition. In fact, no unevenness is experienced in the steam and/or air flow delivered to the trousers being treated, such as would otherwise result in one side of the trousers showing a different final treatment from the other side.

[0042] Also noteworthy is that the simple construction of the apparatus makes for high expectations in the respect of reliable operation and long maintenance-free life of same.

[0043] It should be further noted that the working heads of the apparatus of the invention are multi-functional, in that it is possible to equip them with steaming, blowing and cooling assemblies. The apparatus is therefore highly versatile, flexible, and adaptable to meet different requirements of clothing treating.

[0044] Finally, the apparatus of the invention affords energy usage benefits, which arise from the delivery of steam being controllable, as well as from the steam supply cut-off feature as the tubular support is to be rotated forward one step.

Claims

1. A method for a treatment of ironing and similar clothing articles, particularly uncreased-style trousers by having a plurality of working heads arranged to act on said clothing articles while they are held

in a plurality of grippers, **characterized in that** it comprises mounting said plurality of grippers on a carousel, and rotating the carousel relative to said plurality of working heads maintained stationary to successively take each said clothing article under each working head in said plurality of working heads for treating.

2. A method according to Claim 1, **characterized in that** it comprises treating said clothing articles by at least one of the following: ironing, steaming, blowing, drying, heating and cooling, using respective ones of said plurality of working heads.

3. An apparatus for treatment of ironing and similar clothing articles, particularly uncreased-style trousers, which apparatus comprises a plurality of working heads (11-18) and a plurality of grippers (21) in which clothing articles to be treated are gripped, **characterized in that** it comprises a carousel (24,25) mounted in a support frame (2) and carrying said plurality of grippers (21), and that the carousel is rotatable relative to said plurality of working heads (11-18), which are instead maintained stationary on said frame (2), thereby to take each said clothing articles in succession under each working head of said plurality of working heads (11-18) for treating.

4. An apparatus according to Claim 3, **characterized in that** said plurality of working heads (11-18) are provided as a circular array around a set axis (X-X) with said working heads (11-18) placed at equiangular distances apart from each other, and that said carousel (24) includes a tubular support (24) mounted for pivotal movement about said axis (X-X).

5. An apparatus according to Claim 3, **characterized in that** said plurality of working heads (11-18) include at least one working head selected from the following: at least one ironing head, at least one steaming head, at least one blowing head, at least one drying head, at least one heating head, and at least one cooling head.

6. An apparatus according to Claim 4, **characterized in that** said tubular support (24) bears on a bearing block (25) for pivotal movement.

7. An apparatus according to Claim 3, **characterized in that** said plurality of working heads consist of eight working heads as follows: a loading head, four steaming and/or blowing heads, a clothing article cooling and stabilizing head, an unloading head, and a spare loading head.

8. An apparatus according to Claim 7, **characterized in that** said four steaming and/or blowing heads

comprise each a steaming assembly and a blowing assembly.

9. An apparatus according to Claim 8, **characterized in that** said four steaming and/or blowing heads 5
comprise each a cooling assembly.
10. An apparatus according to Claim 8, **characterized in that** said steaming assemblies are supplied from 10
a common steam generator.
11. An apparatus according to Claim 3, **characterized in that** it comprises a valve means (7A) associated 15
with at least one of said working heads to control
and cut-off the steam supply thereto.

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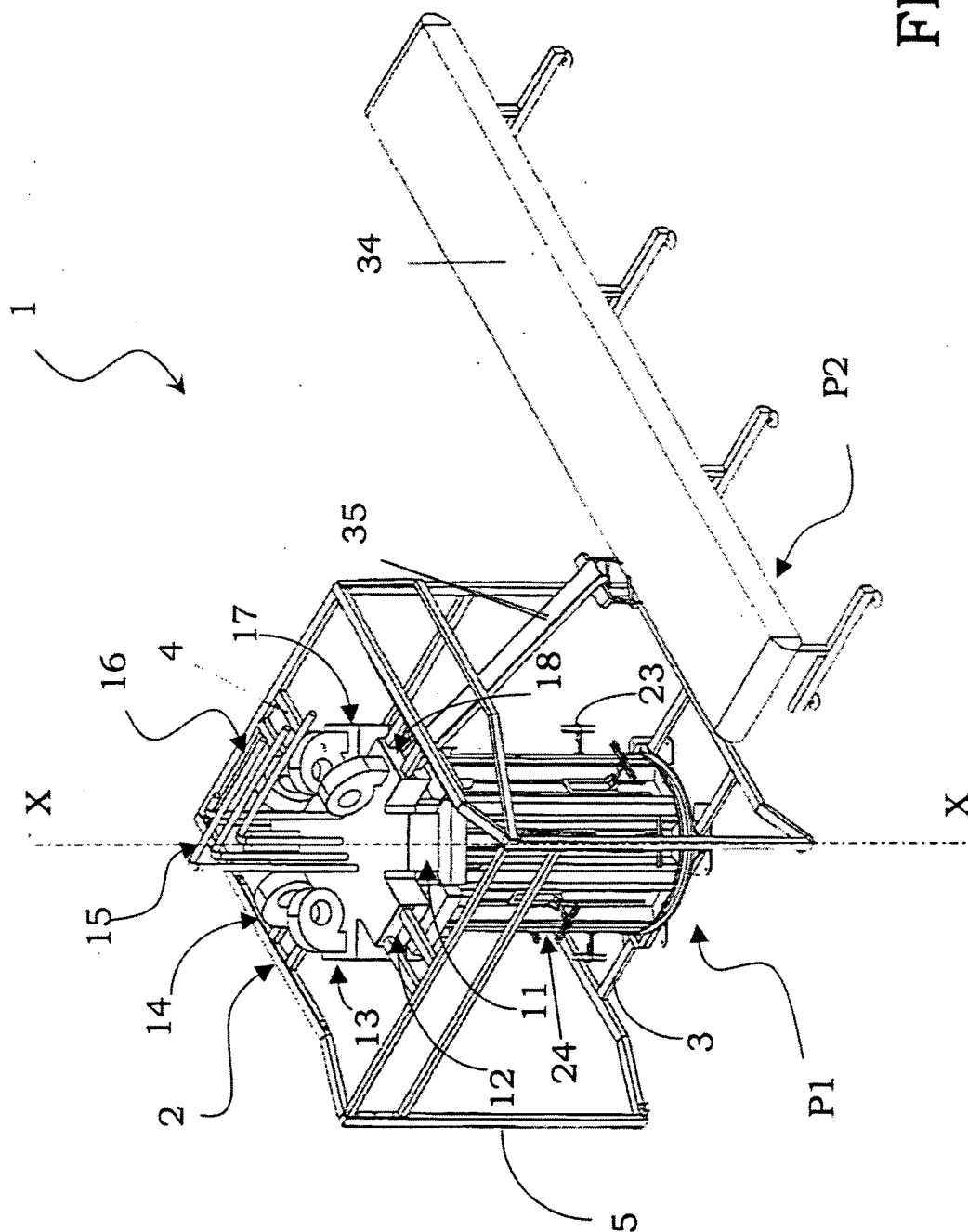


FIG. 1

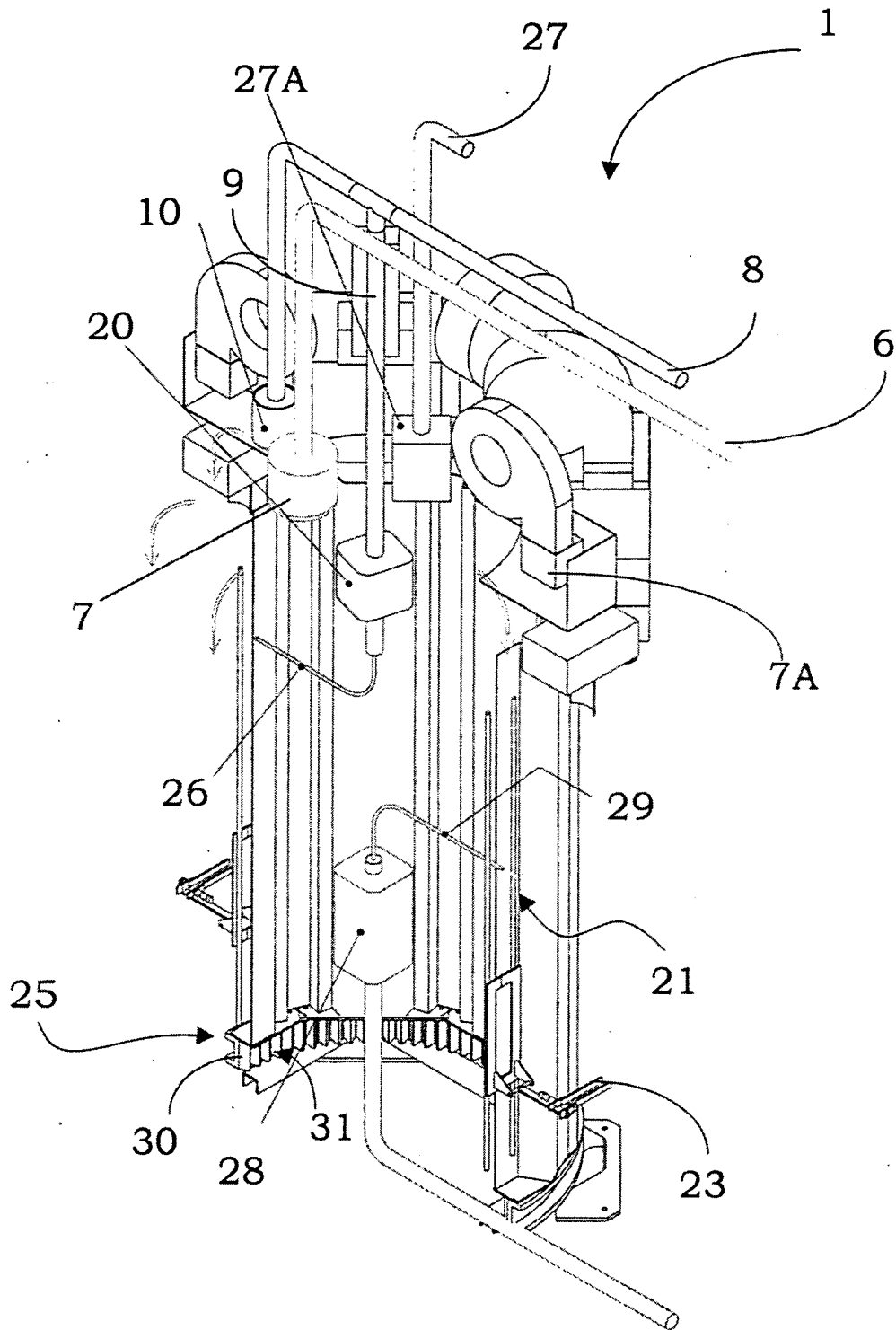


FIG. 2

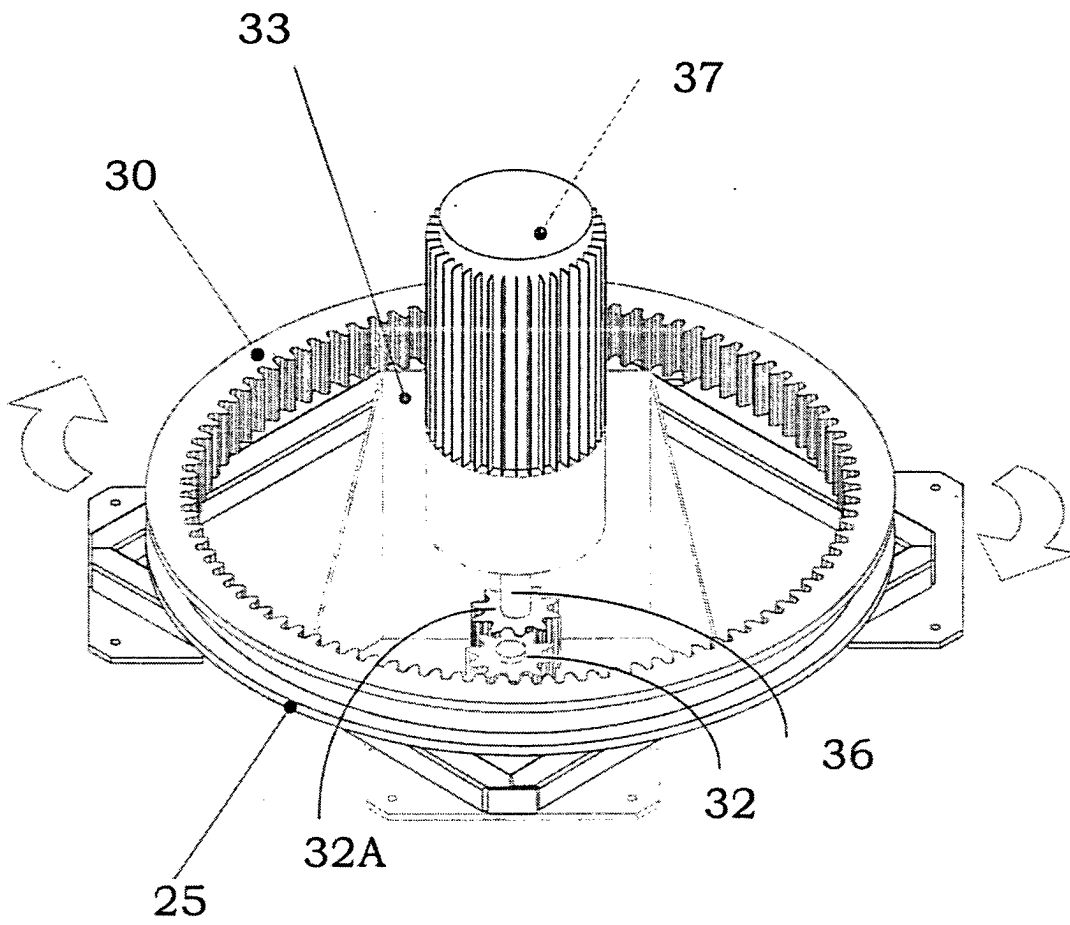


FIG. 3