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⑤④ Lasting shoes using adhesive.

⑤⑦ In lasting shoes from the toe end at least over the ball region, adhesive is applied by an imprinter (I;11) and nozzles (N;34), the region in which adhesive is applied by the plate extending from the toe end of the shoe and lying within, but being substantially smaller than, the region inwiped by the toe wiper assembly (W;7). The nozzles (M;34) may be guided by any suitable control, e.g. shoe-edge guidance, template (56) or programmed control. In one embodiment adhesive application takes place with the wiper assembly (W;7) in an intermediate position in which the wipers have just traversed the insole margin, such arresting of wiper assembly causing a "fall-away" signal to be supplied, in response to which the nozzles (N;34) begin their application of adhesive from adjacent the injector plate (I;11) heelwardly. When the nozzles (N;34) have moved out of the region to be wiped by the wiper assembly (W;7), the wiper assembly (W;7) is caused to continue its inwiping movement.

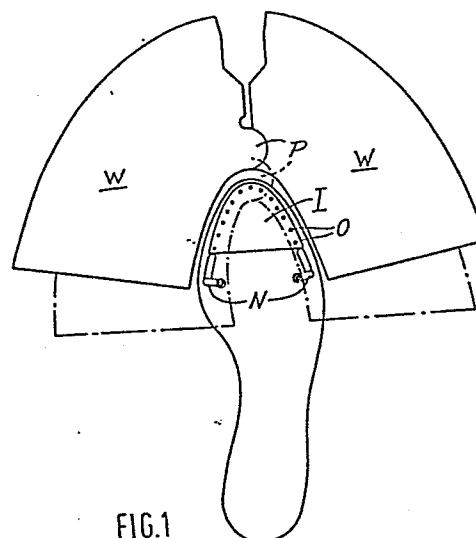


FIG.1

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LASTING SHOES USING ADHESIVE

The present invention is concerned with lasting shoes using adhesive, more especially with a method of lasting shoes, using adhesive, from the toe to at least over the ball region thereof, wherein the toe and forepart region of the shoe is inwiped by means of a pair of wiper plates mounted for inwiping movement about a common pivot located at or adjacent the toe end of the shoe, and wherein the adhesive is applied partly by means of an imprinter plate which is pressed against the shoe bottom and partly by nozzles movable along opposite sides of the shoe.

Such a method is described in, for example, U.S. Patent Specification No. 3399411. In carrying out this method, the region to which adhesive is applied by the imprinter plate extends substantially co-extensively with the region inwiped by the pair of wiper plates. Furthermore, for any change of wiper plates e.g. for changes in the style of the shoe or indeed in some circumstances for changes in size, it is considered necessary to change also the imprinter plate in order to ensure that the wiper plates properly co-operate with the imprinter plate, and for example to avoid any risk of collision as the wiper plates move into engagement with the shoe. This is especially desirable, but not exclusively so, where the wiper plates are first brought into an intermediate position, while the insole continues to be pressed against the last bottom, as described e.g. in U.S. Patent No. 3579691.

It is, however, generally the case that the toes of shoes fall within a relatively small number of what may be termed "generic" styles, e.g. rounded pointed, square. What is more, in most cases within each generic style, the toe region i.e. the region closely adjacent the toe end of the shoe end extending only a relatively short distance

1 therefrom, does not vary significantly between individual
styles.

As mentioned above, the present invention is
regarded as especially desirable, but not exclusively so,
5 in the case of an apparatus of the type described in U.S.
Patent No. 3579691, which apparatus comprising a wiper
assembly which lays the lasting margin over the insole
which has been pressed against the last before the lasting
by an adhesive injector plate, and a control by which the
10 movement of the wiper assembly is arrested in an
intermediate position in which the wiper assembly has just
traversed the margin of the insole, the control also
comprising a signalling device which supplies a "fall away"
signal which effects the falling away of the injector plate
15 from the insole when the wiper assembly is arrested.

In this apparatus, by stopping the wiper
assembly in the intermediate position the result is
achieved that the injector plate presses the insole to the
last bottom as long as possible, namely until, in the
20 intermediate position reached by the wiper assembly, the
latter holds the margin of the insole and thus has taken it
over. In this way any bending of the insole as the wiper
assembly moves inwardly is avoided with certainty, such
bending being especially possible otherwise when flexible
25 insoles are being used. Since upon reaching the
intermediate position the wiper assembly has already
reached significant proximity to the injector plate, the
falling away of the injector plate prior to the continued
movement of the wiper assembly is ensured by the arresting
30 of the wiper assembly and the "fall away" signal, so that
the wiper assembly cannot collide with the injector plate
as it continues its movement.

It is known from German Patent Specification No.
1685424 to provide in addition to an adhesive injector
35 plate adhesive injector nozzles which are moved in the
direction from the heel end towards the toe, so that

1 adhesive bands adjacent to one another are applied. In
this case, however, the injector plate extends from the toe
into the height of the ball region, while the injector
nozzles cover the region from the heel end up to the
5 injector plate. In this known apparatus, furthermore, no
measures are provided whereby a wiper assembly associated
with a lasting region is arrested in an intermediate
position, where the lasting region of the assembly
corresponds substantially with the area of application of
10 the injector plate. Consequently the patent specification
contains no reference to the supply of a particular "fall
away" signal in order to ensure that the injector plate has
fallen away from the insole before the wiper assembly is
closed.

15 If the adhesive applied by the injector plate
extends substantially over the region wiped by the wiper
assembly, which region normally extends up to the ball
region, then some compromise must be accepted with the
injector plate insofar as it has to apply the adhesive for
20 narrow and broad shoes depending upon the shoe size. With
wide shoes the adhesive coating necessarily lies further
inwardly on the insole than in the case of narrow shoes.

It is an object of the present invention to
provide an improved method of lasting shoes, in carrying
25 out which method the region to which adhesive is applied by
the imprinter plate is maintained standardised for a
generic style, regardless of changes of the area unwiped by
the wiper plates for each individual style.

This object is resolved in accordance with the
30 invention in that, in a method as set out in the first
paragraph above, the region to which adhesive is applied by
means of the imprinter plate extends from the toe end of
the shoe and lies within, but is substantially smaller
than, the region inwiped by said pair of wiper plates.

35 It will thus be appreciated that by this method
it is possible to use an imprinter plate which, because it

1 covers only a portion of the region inwiped by the wiper
plates, can be used in combination with more than one set
of such wiper plates, the nozzles then being used for
applying the adhesive in the region no longer covered by
5 the imprinter plate as well as beyond such area.

It has furthermore been found especially
advantageous where the region to which adhesive is applied
by the imprinter plate extends approximately 50mms (2")
measured from the toe of the shoe, along the longitudinal
10 centre line of the toe region of the shoe. Where the
imprinter plate is so dimensioned, it is considered to be
suitable for use with at least the great majority of
individual styles within a generic style, thus rendering it
necessary to provide only one such plate for each generic
15 style. What is more, where the imprinter plate also serves
to hold the insole against the last bottom during an
initial inwiping stage of the wiper plates, an imprinter
plate of such size has been found to be nevertheless
adequate.

20 Preferably the nozzles apply adhesive starting
adjacent the imprinter plate and being moved progressively
heelwards therefrom. Furthermore, the method in accordance
with the invention has been found especially advantageous
where the nozzles apply adhesive along the side portions of
25 the shoe up to the heel breast region thereof.

It will of course be appreciated that, while the
imprinter plate can be considered as "standardised", the
path of movement of the nozzles in carrying out the method
in accordance with the invention has to be controlled
30 according to the individual style of shoe to be lasted. To
this end, therefore, preferably the nozzles are guided
along the shoe bottom by control means according to a
pre-programmed set of parameters appropriate to the style
of shoe lasted. More particularly, conveniently the
35 control means comprises a computer which, in accordance
with a preselected set of digitized co-ordinate axis values

1 stored in memory means associated with said computer,
supplies control signals to n.c. motors (as herein defined)
by which the nozzles are moved along the side portion of
the shoe.

5 The term "n.c. motor" where used herein is to be
understood as a motor the operation of which is controlled
by control pulses supplied thereto in accordance with
digitized information appropriate to the desired operation
of the motor. Where two motors operate in conjunction with
10 one another, e.g. to move a tool along a desired path, the
digitized information is usually in the form of digitized
co-ordinate axis values. Examples of such motors are
stepping motors and d.c. servomotors.

It is a further object of the present invention
15 to provide an improved footwear lasting apparatus in the
operation of which the adhesive coatings may be
accommodated to different shoe widths, while however
preserving the need for pressing the insole against the
last by means of the injector plate and the taking over of
20 the insole by the wiper assembly in the intermediate
position thereof, without thereby losing the required
certainty that the wiper assembly cannot collide with a
component of the apparatus, for which purpose the "fall
away" signal mentioned in the introduction is used to
25 effect the falling away of the injector plate from the
insole.

This further object is resolved in accordance
with the invention, in an apparatus as set out in the
fourth paragraph above, in that the "fall away" signal is
30 supplied to a latching member which is controlled by a
sensor, which in the region of advance is associated with
adhesive injector nozzles movable from adjacent the
injector plate away therefrom, in such a manner that as the
injector nozzles move, the sensor unlatches the latching
35 member after the nozzles have moved over the region which
is wiped by the wiper assembly and when they reach a

1 position in which the wiper assembly can continue its
movement, the latching element initiating the closing of
the wiper assembly.

Alternatively, the said further object is
5 resolved, also in accordance with the invention, in an
apparatus as set out in the fourth paragraph above, in
that the "fall away" signal is supplied to a timer member
which with regard to adhesive injector nozzles movable from
adjacent the injector plate away therefrom initiates the
10 closing of the wiper assembly after the nozzles have moved
over an area wiped by the wiper assembly and at the
earliest when they have reached a position in which the
movement of the wiper assembly can be continued.

In both cases the region wiped by the wiper
15 assembly is provided for in respect of the adhesive coating
on the one hand by the injector plate (in the toe region of
the shoe) and on the other by the adhesive injector nozzles
(in the adjacent region in the direction of the ball
region), whereby only that region of the shoe forepart
20 which extends from the toe up to the ball region is left to
the injector plate, in which with different shoe sizes the
particular width of the shoe is not substantially altered.
In the following region, which extends into the ball region
and beyond, wherein changes of the shoe size are rendered
25 more strongly noticeable by changes in width, the adhesive
coating is achieved by means of the adhesive injector
nozzles, which with regard to their guidance can be
accommodated in known manner as desired to the particular
desired shoe contour, for example by sensing the lasting
30 margin or the insole edge or by template or programmed
control. Accordingly, by means of the latching member or
the timer member, as the case may be, it is ensured that in
this case too the injector nozzles are moved away from the
injector plate sufficiently far that the wiper assembly can
35 continue its movement unhindered. In the case of the use
of the latching member this is achieved by the feeler which

1 is actuated by the injector nozzles and which unlatches the
latching member by means of a signal, while in the case of
the use of the timer member this ensures that the "fall
away" signal is delayed for a period until the injector
5 nozzles have with certainty reached a position in which
they can no longer hinder the continued movement of the
wiper assembly.

In the case of the use of the latching member the
falling away of the injector plate can be controlled in
10 different ways. On the one hand this can take place so
that the "fall away" signal is supplied to the actuating
means for the injector plate, bypassing the latching
member. In this case, therefore, a relative early falling
away of the injector plate takes place. On the other
15 hand, the control can also ensure that the unlatching of
the latching member initiates the falling away of the
injector plate. In this case the injector plate presses
against the insole for a relatively long period, whereby
the adhesive applied by the injector plate is then
20 prevented from cooling at too early a time.

Also in the case of the use of the timer member
such a different control can be used. On the one hand the
"fall away" signal is supplied to the actuating means for
the injector plate, bypassing the timer member. In this
25 case, therefore, similarly as in the previously described
case a relatively early falling away of the injector plate
takes place. On the other hand, the falling away of the
injector plate can be initiated also by the timer member
itself. In this case, therefore, the pressing of the
30 injector plate against the insole is maintained for a
longer period.

In this connection it is pointed out that in the
case of the use of the latching member and the initiation
of the falling away of the injector plate by the unlatching
35 of the latching member it is possible to select the
position of the sensor so that it is actuated by the

1 injector nozzles at a point in time wherein the injector
nozzles have not yet completely moved out of the region
covered by the wiper assembly. In this case the speed of
the movement of the wiper assembly and of the movement of
5 the injector nozzles must be determined relative to one
another such that in any event in the closed position of
the wiper assembly no injector nozzle stands in the way
thereof.

An additional degree of security with respect to
10 the prevention of the collision of the wiper assembly
against the injector plate is provided in that the
initiation of the continuation of the movement of the wiper
assembly as compared with the initiation of the falling
away of the injector plate is delayed by a delaying member.
15 In this way it is ensured that the continuation of movement
of the wiper assembly is initiated only by the time span
defined by the delaying member after the initiation of the
falling away of the injector plate. This is especially of
significance if, in the apparatus in question, the wiper
20 assembly in its intermediate position is already close to
the injector plate.

An injector plate length which takes into account
both pressing the insole sufficiently against the last and
also the difference in shoe width depending upon different
25 shoe sizes is obtained when the start of the path of the
injector nozzles, being adjacent the end of the injector
plate facing the ball region, is disposed substantially at
the middle of the forepart of the shoe, extending from the
toe of the shoe to the ball region. In this case the
30 injector plate extends also up to the middle of the shoe
forepart portion, so that it can perform its pressure
function in respect of half the length of the shoe
forepart, which has generally shown itself to be
sufficient. In the middle of the shoe forepart portion
35 changes of shoe size do not have an especially strong
influence on a particular width of shoe, so that with such

1 a shape of the injector plate and the guidance of the
injector nozzles a large number of shoe shapes and sizes
are accommodated with a single injector plate. In this
way there arises a certain standardisation for the injector
5 plate, which leads to a significant cheapening of the tools
necessary for the lasting operation. In order that, in
the transitional region from the injector plate to the path
of the injector nozzles, no interruption of the adhesive
coating arises, the path of the injector nozzles can be so
10 shaped that it overlaps the position of the injector plate
when the latter is in pressing condition. In this case
the control for the injector nozzles need merely to be so
constructed that, before bringing the injector plate
against the insole, the nozzles have traversed a short
15 region which is then, after the continuation of the
movement of the injector nozzles away from the toe, also
embraced by the injector plate, which is brought into
contact with the insole only after the continuation of
movement of the injector nozzles.

20 The apparatus, furthermore, reveals the advantage
of the use of different adhesives for the region catered
for by the injector plate and the region traversed by the
injector nozzles. This is of important because especially
the ball region is subjected to substantially stronger
25 flexing movements when the shoe in question is being worn
than is the case for the toe region. For this purpose the
injector plate and the injector nozzles are connected to
separate adhesive supplies each with different adhesive, an
adhesive which remains elastic being supplied to the
30 injector nozzles, while the injector plate has an adhesive
which hardens off more strongly. The latter adhesive
normally has the property that it hardens off more quickly,
which is of special significance for rapid and reliable
bonding in the toe region.

35 There now follows a detailed description, to be
read with reference to the accompanying drawings, of one

1 method of lasting shoes and one apparatus for lasting
shoes, said method and apparatus being in accordance with
the present invention. It will of course be appreciated
that this method and this apparatus have been selected for
5 description by way of non-limiting example only.

In the accompanying drawings:-

Figure 1 is a schematic view of a shoe bottom,
indicating the regions thereof to which adhesive is applied
respectively by an imprinter plate and by nozzles and also
10 the region inwiped by a pair of wiper plates;

Figure 2 is a diagrammatic representation of the
apparatus in accordance with the invention, said apparatus
utilising a latching member;

Figure 3 is a diagrammatic representation of an
15 apparatus otherwise generally similar to that of Figure 2,
but showing a timer member to replace the latching member;
and

Figure 4 is a side view of the apparatus in
accordance with the invention, showing various
20 constructional details thereof.

The method in accordance with the invention now
to be described is a method of lasting shoes, more
especially of lasting toe, forepart and side regions of
shoes. Conventionally the toe and forepart regions of
25 shoes are today lasted by so-called pulling over and toe
lasting machines, while the side portions are thereafter
lasted by so-called side lasting machines. However, it has
been proposed to combine these operations in a single
apparatus: see e.g. European Patent Application No.
30 81305977.1 (Publication No. 0055107). It is intended that
the present invention may be carried out in such a combined
machine suitably modified for the purpose.

Thus in carrying out this method in accordance
with the present invention, the shoe to be lasted,
35 comprising a shoe upper on a last and an insole on the last
bottom, is placed, bottom down, on a shoe support and the

1 margin of the upper is located in a plurality of grippers
arranged around the shoe support in conventional manner.
The upper is then tensioned over its last, again as is
conventional, and a pair of wiper plates W, mounted for
5 inwiping movement about a common pivot P located at or
adjacent the toe end of the shoe, are brought into an
intermediate position in which they trap the upper against
the margin of the insole, the grippers at the same time
releasing their grip and also a toe band being applied to
10 press the upper against the last immediately above the
wiper plates. Again such a method is described in the
aforementioned European Patent Application.

In this position two nozzles N are brought into
engagement with the shoe bottom and also an imprinter plate
15 I. The imprinter plate I extends from the toe of the shoe
heelwardly approximately 50 mm (2"), as measured along the
longitudinal centre line of the toe region of the shoe;
that is to say, the plate I, and thus the region of the
insole covered thereby, is substantially smaller than the
20 region to be inwiped subsequently by the wiper plates W.

The nozzles N are caused to move heelwardly, from
a position adjacent the imprinter plate I, along opposite
sides of the shoe bottom, in a manner substantially as
described in the aforementioned European Patent
25 Application; that is to say, the nozzles N are guided e.g.
by computer control means supplying drive signals to
suitable n.c. motors (as herein defined), in accordance
with a set of digitized co-ordinate axis values stored in
suitable memory means associated with the computer, such
30 set being selected according to the style of shoe being
operated upon and modified according to the size of such
shoe. (This size may conveniently be measured by the
movement of the heel rest against the shoe, as described in
the aforementioned European Patent Application).

35 In carrying out the method in accordance with the
invention, as soon as the nozzles N have passed beyond the

1 region to be inwiped by the wiper plates W, the latter are
caused to continue their inwiping movement. Such further
movement is controlled by the computer control means, which
is also effective to ensure that the imprinter plate I is
5 moved out of engagement with the insole so as to avoid any
rise of collision of the wiper plates W with the imprinter
plate I, as described in the aforementioned U.S. Patent No.
3579691.

The side lasting of the shoe can take place, in
10 carrying out the method in accordance with the invention,
using any suitable conventional means. For example, as in
the machine described in European Patent Application,
lasting rolls may be used. Alternatively conventional
lasting fingers or lasting bands may be used, in which
15 case, side lasting can take place only after the nozzles N
have completed their movement. Again within the scope of
the present invention is included a method in which a shoe
is lasted from the toe over the ball region only; in
carrying out such a method conventional ball wipers linked
20 to the wiper plates may be used.

Although in carrying out the method described
above the wiper plates are arrested in an intermediate
position, whereafter the application of adhesive takes
place, it is to be understood that in carrying out other
25 methods in accordance with the invention the application of
adhesive can take place before any inwiping movement of the
wiper plates is initiated.

Further details of the present invention are now
to be described with reference to the apparatus shown in
30 Figures 2 to 4. It will be appreciated that, unlike the
machine described in the aforementioned European Patent
Application, this apparatus is suitable for lasting shoes
from the toe end over the ball region up to the shank
region only.

35 In Fig. 2 is shown a lasted shoe 9 which is held
in its position (see also Fig.4) by means only partially

1 shown in Fig. 2. Against the insole 8 of the shoe 9 is disposed a shoe support 10 which is so small that it remains in position even when the wiper assembly is moved together. Furthermore pressed against the insole 8 is the
5 injector plate 11 which substantially surrounds the shoe support 10. The injector plate 11 has channels 16 which serve for the supply of adhesive. In front of the shoe is disposed the wiper assembly 7 which is journalled in the mounting 5. The wiper assembly 7 is actuated by means of
10 the ram head 17, which applies pressure to the mounting 5. The ram head 17 is positioned at the end of the ram 18, which serves as the advancing arrangement for the wiper assembly and which is journalled in the piston 4. The piston 4 is moved to-and-fro in the cylinder 19 by means of
15 hydraulic or pneumatic forces. The ram 18 extends through the piston 4 towards the other side and terminates in the abutment 1. When the piston 4 is advanced towards the right the abutment 1 of the ram 18 moves therewith until the abutment 1 reaches the chain-dot position in which it
20 engages the wedge 2. The wedge 2 is supported on the actuator mechanism 3 which enables the wedge 2 to be withdrawn.

The injector plate 11 is mounted on actuating means comprising the ram 20 and the piston 21, the latter
25 being moved hydraulically or pneumatically to-and-fro in the cylinder 22.

When this apparatus is actuated the following detailed steps take place:

In response to an appropriate initiation, e.g.
30 actuation of the apparatus by an operator by depressing a treadle, the piston 4 is hydraulically or pneumatically actuated. The piston 4 is thus moved to the right, moving both the wiper assembly 7 therewith, through the ram head 17, and also the abutment 1, through the ram 18. This
35 advancing movement takes place until the abutment 1 engages the wedge 2, whereupon the wiper assembly assumes the

1 chain-dot position in which it has just traversed the
lasting margin 25. The continuation of movement of the
piston 4 of the wiper assembly 7 is prevented first by the
engagement of the abutment 1 with the wedge 2. With the
5 engagement of the abutment 1 with the wedge 2 the valve 30,
which serves as a signalling device, is actuated, whereby
the pressure medium supplied to the source 31 is switched
and applies pressure in the line 32, which leads to the
latching valve 33, serving as a latching member.

10 By means of an advance control (which is known
but not of interest in this connection), furthermore, the
adhesive injector nozzle 34 is guided over the insole 8
adjacent the lasting margin, and indeed starting from the
injector plate 11 away therefrom, the injector nozzle 34
15 passing over substantially the ball region of the lasted
shoe 9. During this advance of the injector nozzle 34,
the latter, by means of its cam 35, engages the plunger of
the valve 36, as shown in Fig. 2, so that in the position
shown the valve 36 is switched through the injector nozzle
20 34 and thus the pressure fluid at the source 37 is switched
via the line 38 to the latching valve 33. The
continuation of the movement of the injector nozzle 34 is
then maintained, as well as the supply of adhesive;
details in this connection are not material.

25 By switching the pressure fluid through the valve
36 the latching valve 33 is switched, whereupon the
pressure fluid at the line 32 is switched through on the
one hand to the line 39, which leads to the cylinder 22,
and on the other hand through the line 40, from where the
30 fluid pressure is supplied to the auxiliary valve 41. At
the cylinder 22 the supplied pressure fluid effects the
downward movement of the piston 21 and thus the falling
away of the injector plate 11, which finally reaches the
chain-dot position. The injector plate thus no longer
35 stands in the way of the continuation of the movement of
the wiper assembly 7.

1 At the source 42 for the auxiliary valve 41
pressure fluid is also available, which is switched, when
charged via the line 40, so that the pressure is removed
from the line 43 and switched to the line 44. The
5 actuating mechanism 3 was previously actuated via the line
43 and thus had brought the wedge 2 into the position shown
in Fig.2. With the switching of the pressure from line 43
to line 44 the actuator mechanism 3 is now actuated in
reverse direction, so that it withdraws the wedge 2 into
10 the position shown in chain-dot. As a consequence of the
inclination of the abutment surfaces 29 this withdrawal of
the wedge 2 can take place without difficulties. In this
way, the further path of the piston 4 with the ram 18 is
left free, so that the wiper assembly 7 can advance further
15 from its intermediate position shown in chain-dot into its
end position. In this movement it is not hindered by the
pressure plate 11, since the latter, as already mentioned,
has previously fallen away (see chain-dot position). By
the actuation of the valve 36, which acts as a sensor, it
20 is also thereby ensured that the injector nozzle 34, and in
the same way also the other injector nozzle for the other
side of the shoe, not shown in Fig. 2, is moved out of the
region which is traversed by the wiper assembly, so that
altogether the closing of the wiper assembly 7 is in no way
25 hindered.

The auxiliary valve 41 has not only the object of
switching pressure from the line 43 to the line 44 and vice
versa, but also exercises the function of a delaying
member, since the effect of the pressure fluid switched
30 from the latching valve 33 is delayed in respect of its
acting upon the actuator mechanism 3. The pressure fluid
supplied via the line 39 in fact acts directly on the
cylinder 22 and effects thereby the immediate falling away
of the injector plate 11, in comparison with which the
35 further movement of the wiper assembly 7, made possible by
the actuator mechanism 3 in withdrawing the wedge 2 is

1 initiated only after the valve 41 has been switched.
Between the actuation of the piston 21 in the cylinder 22
and the actuation of the actuator mechanism 3, therefore,
there is, as a time differential, the switching time of the
5 auxiliary valve 41. This leads to an enhancement of the
certainty against a collision of the wiper assembly 7
against the injector plate 11 or injector nozzles 34.

In Figure 2 the line 73 shown in dotted branching
from the line 32 is drawn in and connects the line 32
10 directly with the input port 74 of the cylinder 22. If
the line 73 is utilised, the line 39 is omitted. In this
type of control a direct initiation of the falling away of
the injector plate 11 is achieved by the "fall away" signal
supplied via the line 32 so that, upon the "fall away"
15 signal being supplied when the abutment 1 engages the wedge
2 (actuation of the valve 30), the injector plate 11
immediately falls away. In this case, therefore, the
latching valve 33 is bypassed by the "fall away" signal.

In the the exemplary embodiment shown in Fig. 3
20 it is a matter of a modification vis-a-vis the exemplary
embodiment of Fig.2. The modification consists in that
the actuation of the latching valve 33, which serves as a
latching member, takes place by means of the timer member
45, so that the cam 35, shown in Fig.2 and constituting the
25 sensor, together with the valve 36 can be omitted. Apart
from this difference the device of Fig.3 operates in the
same way as that of Fig. 2, so that in this regard
reference can be had to the explanations to Fig.2. In
accordance with Fig.3 the pressure fluid switched through
30 by valve 30 is supplied via the line 32 and the timer
member 45 to the latching valve 33, so that the latching
valve 33, after the expiry of the time span defined by the
timer member 45, is switched and thereafter initiates the
steps explained with reference to Figure 2, namely first
35 the falling away of the injector plate 11 and, delayed by
the auxiliary valve 41, the withdrawal of the wedge 2 and

1 thereby the continuation of the movement of the wiper
assembly 7. The timer member 45 is so adjusted that the
switching of the latching valve 33 only takes place when
the adhesive injector nozzle 34 has with certainty moved
5 sufficiently far that it can no longer hinder the closing
of the wiper assembly. In order to be able in such case
to take account of the different advance times of the
injector nozzles 34, it is a question with this timer
member 45 of an adjustable component, as is customary in
10 the trade.

In Figure 3 is drawn in the line 75 (shown in
dotted line) branching from the line 32, and, when it is
used, replacing the line 39. The line 75 thus leads
directly from the pipe 32 to the input ports 74 of the
15 cylinder 22 so that therefore in this case the timer member
45 and the latching valve 33 is (sic) bypassed. Using
this control given by the line 75, similarly as in
connection with the line 73 described with reference to
Figure 2, a direct initiation of the falling away of the
20 injector plate 11 takes place in the case of the provision
of the "fall away" signal by the valve 30, so that
therefore the falling away of the injector plate 11 is
initiated already when the wiper assembly reaches its stop
position.

25 It is pointed out in this connection that the
position of the injector nozzles 34 enabling the wiper
assembly 7, to be closed can be achieved in different ways.
Firstly it is possible to move the injector nozzles 34 away
from the injector plate 11 sufficiently far in the
30 direction of the heel seat that the adhesive nozzles 34
are displaced in this direction sufficiently from the wiper
ends 47a and 47b. The adhesive nozzles 34 assume then the
position shown in chain-dot line. It is however also
possible to raise the adhesive nozzles 34 at the end of
35 their advancing movement over the insole 8 away from the
latter sufficiently far that the wiper assembly 7, can move

1 past the adhesive nozzles 34. In this case it is possible
to allow the advancing movement of the adhesive nozzles 34
to run from the heel end in the direction of the toe of the
shoe and, at the end of this advancing movement, to raise
5 the adhesive nozzles 34 from the insole 8 immediately in
front of the injector plate 11, in order to clear the path
for the closing of the wiper assembly 7.

In Fig. 4 are shown the mechanical details of the
apparatus essential in this connection, those elements of
10 the machine however being omitted for the sake of clarity
which are immaterial in this connection and which belong in
any event to the state of the art since they are
conventional components of an apparatus for lasting
footwear.

15 The apparatus shown in Fig. 4 comprises the shoe
support 10 which supports the last 9, on which an upper is
mounted(not shown). The last 9 is held from the heel seat
thereof by the heel support 48 which applies to the last 9
from the heel seat a pressure which is accommodated by the
20 shoe abutment 49 which holds the toe. The shoe abutment
49 is connected in known manner with the last support 50,
which is carried by the piston 51. By the movement of the
piston 51 the last support 50 together with the last 9 is
brought into the position desired for lasting, whereupon,
25 after lasting is completed, the last support 50 is again
moved away from the last 9 together with the shoe support
10. On the last support 50 furthermore is mounted the
injector plate 11 which, as described with reference to
Figs. 2 and 3, is movable to-and-fro by means of the piston
30 21 in the cylinder 22. In Fig. 4 the injector plate 11 is
shown in the "fall away" position shown in chain-dot line
in Figs. 1 and 2.

In Fig. 4 is also shown a portion of the machine
frame 52 on which both the last support 50 and also further
35 elements are secured namely the support 53 for the pincers
54 for pulling the upper over the last 9 (the further

1 pincers are not drawn in for reasons of clarity) and the
holder 55 for a stack of templates 56 which are sensed in
known manner by the roll 57, whereby the necessary movement
is given to the injector nozzle 54 (and the further
5 injector nozzle (not shown)).

The injector nozzle 34 is mounted on the end of
the carrier arm 58 which is connected via the piston rod 59
with the piston 60. The piston 60 is moved to-and-fro in
the cylinder 61 by means of pneumatic or hydraulic means,
10 whereby a corresponding movement of the injector nozzle 34
ensues. The carrier arm 58 together with the piston rod
59, the piston 60 and the cylinder 61, rests in the
swinging arm 62 which is mounted for rotation on the axis
63. The lever 64 is connected with the swinging arm 62
15 and is also connected at its end with the piston rod 65 by
to-and-fro movement of which the lever 64 is corresponding
swung, since it is also journalled for pivoting movement on
the axis 63. By the pivotal movement of the lever 64 the
latter moves the swinging arm correspondingly therewith.
20 The swinging arm 62 is, furthermore, rotatably mounted on
the axis 66 in such a manner that the swinging arm 62 can
be pivoted out of and into the plane of the drawing. By
being able to be moved as aforesaid any desired advancing
movement can be given to the nozzle 34, so that it is
25 possible to accommodate to the shape of the bottom of the
last 9 and to move away as necessary out of the closing
area of the wiper assembly 7.

Also in Fig. 4 is schematically shown the supply
of adhesive to the injector nozzle 34 and to the injector
30 plate 11. The adhesive, in the form of rods 67 and 68, is
unwound from the rolls 69, the feed mechanism 70 serving
this purpose. The rods 67 and 68 (shown interrupted for
reasons of clarity) then arrive at the inlet 71 for the
injector nozzle 34 and the inlet 72 for the injector plate
35 11, whereupon they are heated in known manner so that
flowable adhesive exits at the injector nozzle 34 and the

1 injector plate 11. It should in this connection by
pointed out that the adhesive rod 68 is present in
duplicate since, as shown in Fig. 3, two adhesive nozzles
34 are provided. In the case of the adhesive rods 67 and
5 68, as already mentioned above it can be a question of rods
of different adhesive in order to fulfil special
flexibility conditions in the lasted shoe.

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1 Claims:

1. Method of lasting shoes, using adhesive,
from the toe to at least over the ball region thereof,
wherein the toe and forepart region of the shoe is inwiped
5 by means of a pair of wiper plates mounted for inwiping
movement about a common pivot located at or adjacent the
toe end of the shoe, and wherein the adhesive is applied
partly by means of an imprinter plate which is pressed
against the shoe bottom and partly by nozzles movable along
10 opposite sides of the shoe, characterised in that the
region to which adhesive is applied by means of the
imprinter plate extends from the toe end of the shoe and
lies within, but is substantially smaller than, the region
inwiped by said pair of wiper plates.

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2. Method according to Claim 1 characterised in
that the region to which adhesive is applied by the
imprinter plate extends approximately 50mms (2") from the
toe of the shoe, measured along the longitudinal centre
20 line of the toe region of the shoe.

3. Method according to either one of Claims 1
and 2 characterised in that the nozzles apply adhesive
starting adjacent the imprinter plate and being moved
25 progressively heelwards therefrom.

4. Apparatus for lasting footwear comprising a
wiper assembly (7) which lays the lasting margin over the
insole which has been pressed against the last before the
30 lasting by an adhesive injector plate (11), and a control
(1,2,30) by which the movement of the wiper assembly (7) is
arrested in an intermediate position in which the wiper
assembly (7) has just traversed the margin of the insole,
the control (1,2,30) also comprising a signalling device
35 (30) which supplies a "fall away" signal which effects the
falling away of the injector plate (11) from the insole

1 when the wiper assembly (7) is arrested, characterised in
that the "fall away" signal is supplied to a latching
member (33) which is controlled by a sensor (35), which in
the region of advance is associated with adhesive injector
5 nozzles (34) movable from adjacent the injector plate (11)
away therefrom, in such a manner that as the injector
nozzles (34) move, the sensor (35) unlatches the latching
member (33) after the nozzles (34) have moved over the
region which is wiped by the wiper assembly (7) and when
10 they reach a position in which the wiper assembly (7) can
continue its movement, the latching element (33) initiating
the closing of the wiper assembly (7).

5. Apparatus for lasting footwear comprising a
15 wiper assembly (7) which lays the lasting margin over the
insole which has been pressed against the last before the
lasting by an adhesive injector plate (11), and a control
(1,2,30) by which the movement of the wiper assembly (7) is
arrested in an intermediate position in which the wiper
20 assembly (7) has just traversed the margin of the insole,
the control (1,2,30) also comprising a signalling device
(30) which supplies a "fall away" signal which effects the
falling away of the injector plate (11) from the insole
when the wiper assembly (7) is arrested, characterised in
25 that the "fall away" signal is supplied to a timer member
(45) which with regard to adhesive injector nozzles (34)
movable from adjacent the injector plate (11) away
therefrom initiates the closing of the wiper assembly (7)
after the nozzles have moved over an area wiped by the
30 wiper assembly (7) and at the earliest when they have
reached a position in which the movement of the wiper
assembly (7) can be continued.

6. Apparatus according to either one of Claims
35 4 and 5 characterised in that the "fall-away" signal is
supplied to the actuator device (20, 21, 22) for the

1 injector plate (11), by-passing the latching member (33) or
timer member (45), as the case may be.

5 7. Apparatus according to either one of Claims
4 and 5 characterised in that the falling away of the
injector plate (11) is initiated by the unlatching of the
latching member (33) or the operation of the timer member
(45), as the case may be.

10 8. Apparatus according to any one of Claims 4
to 7 characterised in that the position of the injector
plate (11) in its pressed-on condition and the path of the
injector nozzles (34) overlap.

15 9. Apparatus according to any one of Claims 4
to 8 characterised in that the injector plate (11) and the
injector nozzles (34) are connected to separate adhesive
supplies (67,68,69,70) each with different adhesive.

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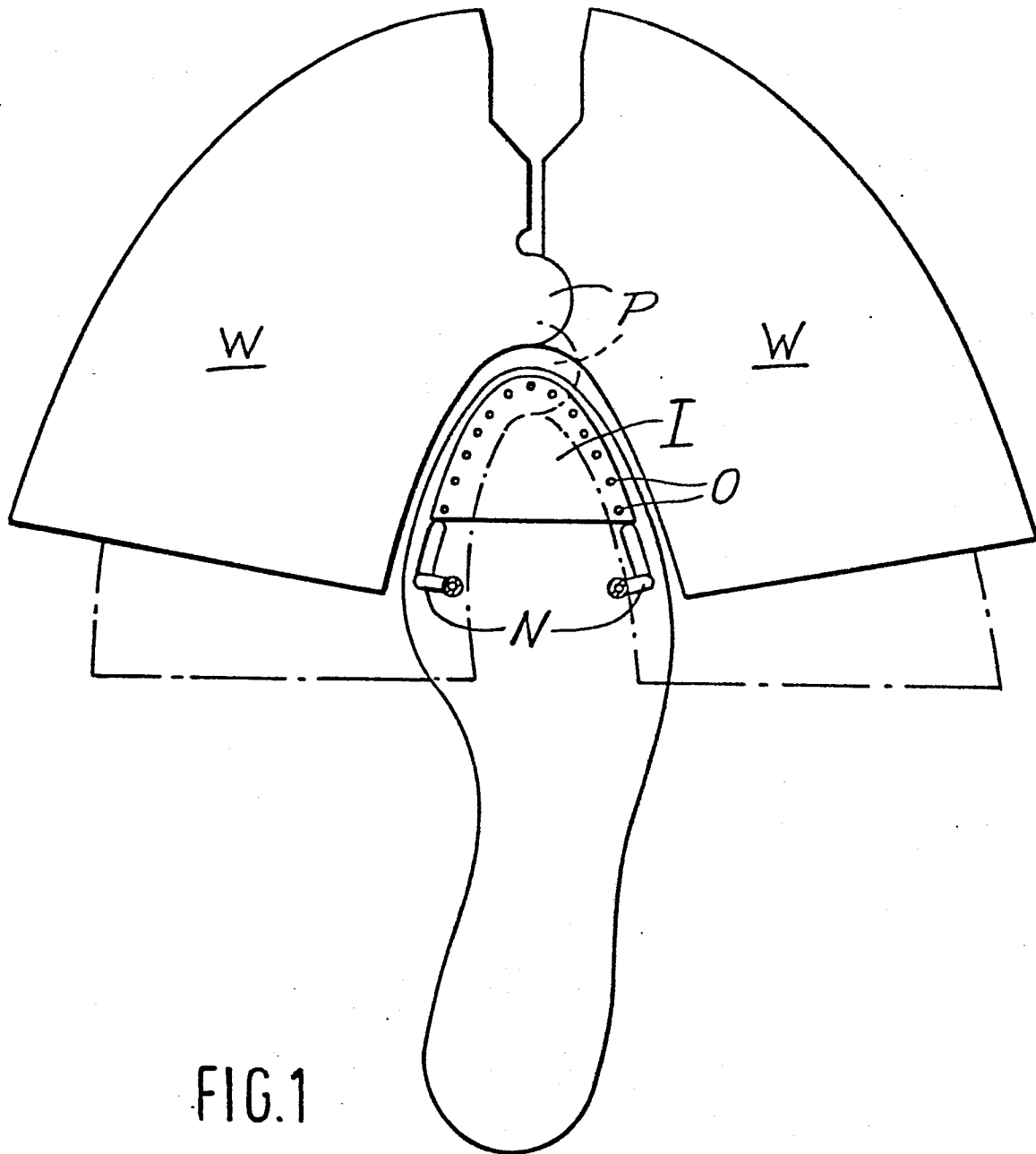


FIG. 1

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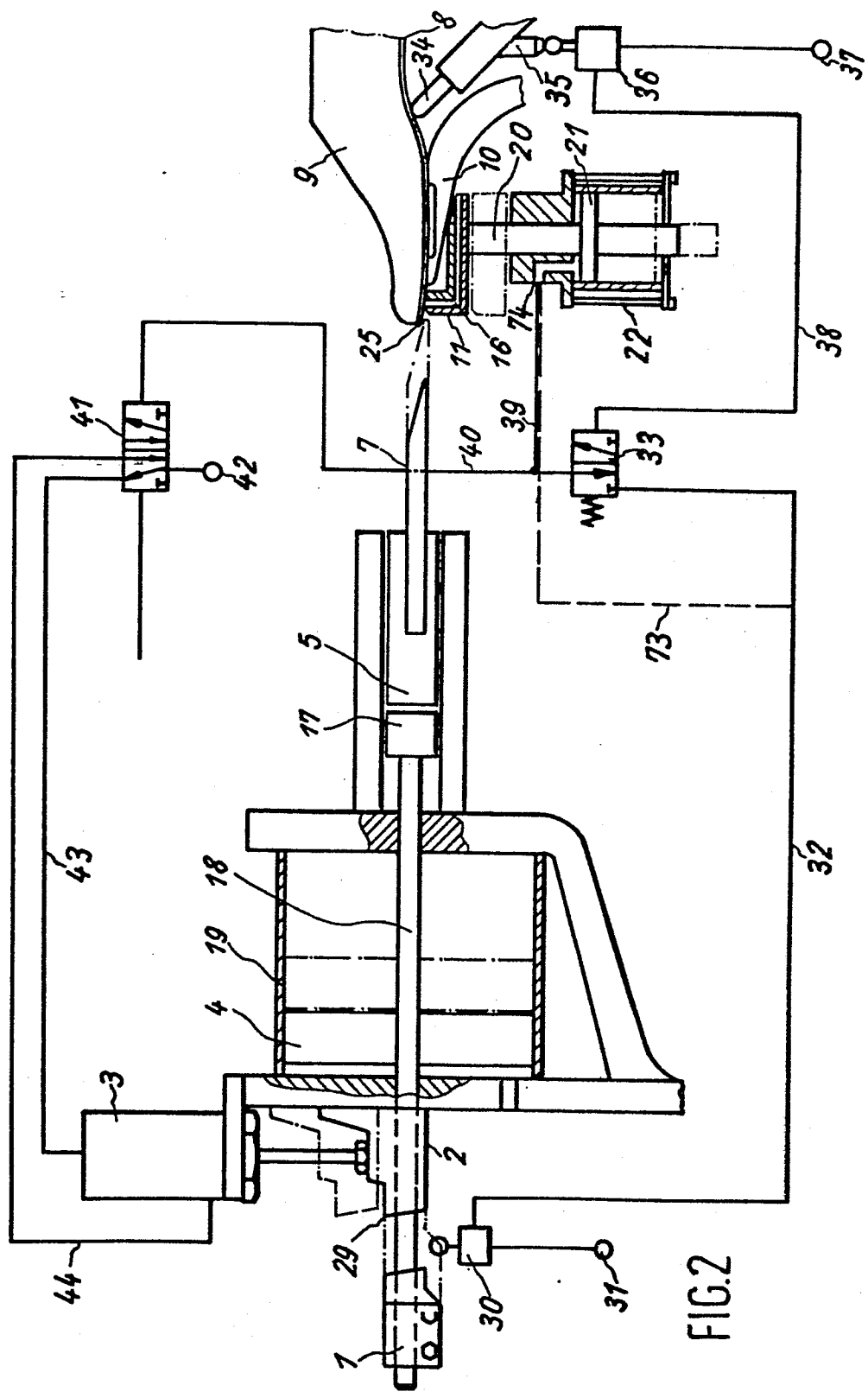


FIG. 2

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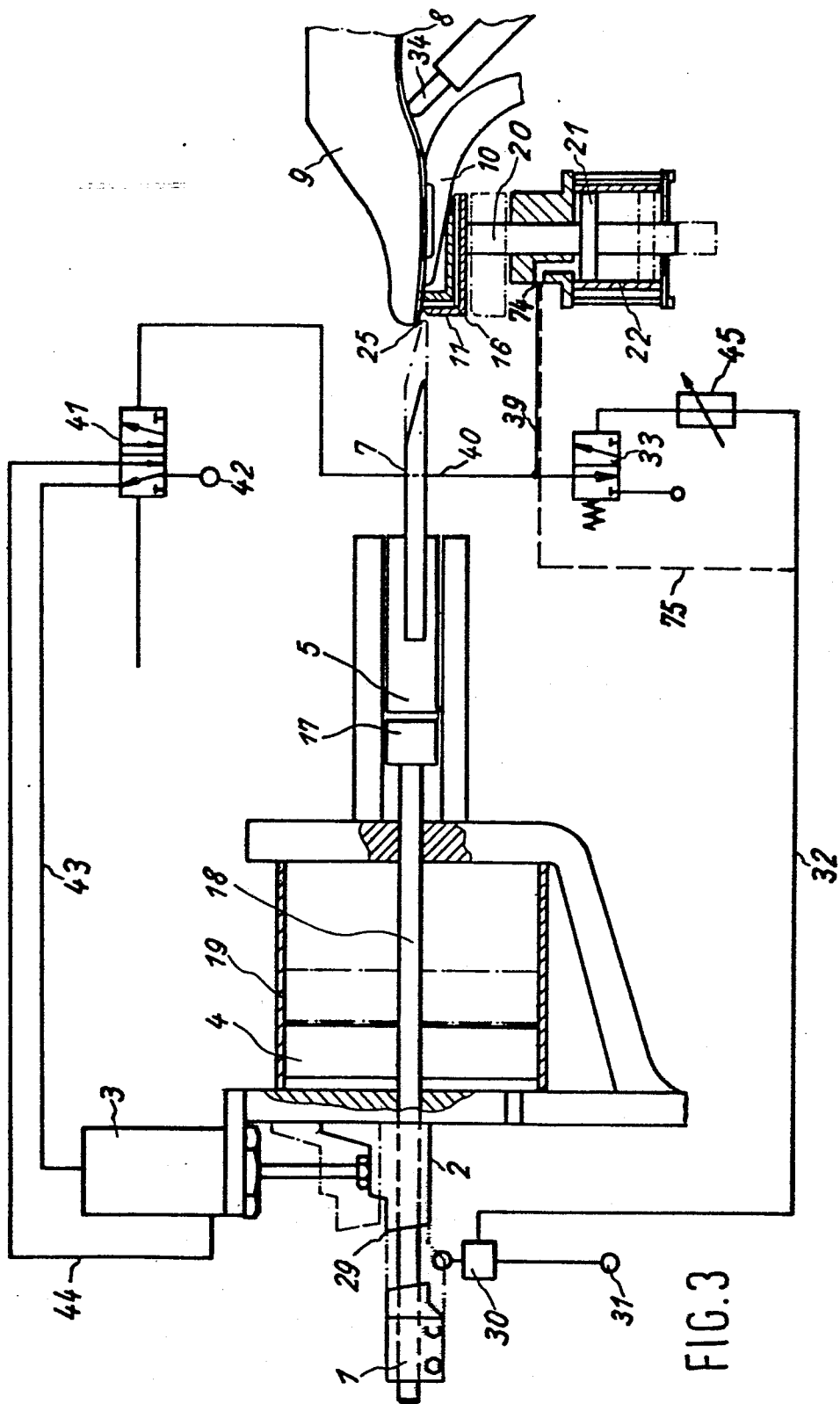


FIG. 3

