(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 368 233 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **89120583.3**

(51) Int. Cl.5: **C14B 1/40**

(22) Date of filing: **07.11.89**

(30) Priority: **07.11.88 IT 8566288**

(43) Date of publication of application:
16.05.90 Bulletin 90/20

(84) Designated Contracting States:
DE ES FR GB

(71) Applicant: **Baggio, Giocondo**
Via Morolazzaro, 21
I-36020 Pove del Grappa (VI)(IT)

(72) Inventor: **Baggio, Giocondo**
Via Morolazzaro, 21
I-36020 Pove del Grappa (VI)(IT)

(74) Representative: **Bonini, Ercole**
c/o STUDIO ING. E. Bonini SAS 8 Corso Fogazzaro
I-36100 Vicenza(IT)

(54) Method for perching leather and machine for carrying out such method.

(57) According to the invention a method for perching leather is developped and a perching machine suited to carry out said perching process are disclosed. The perching process comprises a stage of continuous progress of the leather to be treated, a stage of stretching the leather at several spots of its surface by forcing it by means of pegs to penetrate the holes of a counter-plate and a stage of relaxation of the leather due to the withdrawal of the pegs from the stretching holes, wherein during the stretching stage a simultaneous smoothing operation on the leather surface occurs thanks to the translation of the pegs within the stretching holes.

The perching machine carrying out said process comprises a plurality of plates with pegs (7) each counterposed to a counterplate (11) presenting holes (12), into which the leather (20) is forced to penetrate by the vertical action exerted by the pegs (9) attached to the top of the plates with pegs (7). Each plate with pegs (7) is connected with an articulated quadrilateral (50) and in combination with the rotation of the cam (14) it achieves an alternated vertical rotating and translating motion.

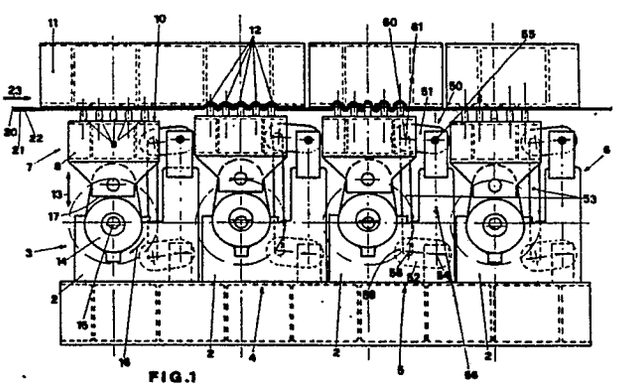

FIG.1

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METHOD FOR PERCHING LEATHER AND MACHINE FOR CARRYING OUT SUCH METHOD

The invention concerns a perching method for leather and a machine suited to perform said process.

It is known that "perching" is a finishing process for leather by means of which the leather acquires characteristics of softness, or, as it is called in the specific technical lingo a good "handle". It is known that the perching process consists in running the leather to be treaded, which is held between two elastic conveyor belts, through a set of pegs which force it to alternatively enter into and exit from the openings of a grid. Thereby on various spots of the leather surface an alterated traction action is created, which is repeated at extremely short intervals, which yields to it the required characteristics of softness and "handle".

An inconvenience caused by said perching machines is represented by the fact that the pegs only exert on the leather a traction force with an alternate verse but in a single direction which does not yield to it that special "handle" which was obtained when manual treatments were applied back when the process was performed by artisans. The machines employed then consisted essentially of a rotating roller on the surface of which the leather to be treated was stretched. Two metal blades were present on two generating lines of the roller and they were pressed against the roller while it was rotating, whereby they applied on the leather being treated a traction action as well as a smoothing action of its surface. The thus obtained handle was much better that the one which is now yielded by the perching machines used at present.

The purpose of the present invention is to develop a perching method which will permit to obtain leather with characteristics of softness and handle comparable to those which are obtained by means of the manually operated finishing machines used in the artisan-type working processes.

Not the least purpose is to provide a perching machine permitting production quantities which are acceptable for modern industrialized productions.

Yet another purpose of the invention is to provide a perching machine suited to carry out said finishing method.

The above-mentioned purposes and others which will be better explained hereafter are fulfilled by the realization of a perching method for leather which, in accordance with the patent claims, is characterized in that it comprises a stage of feeding the leather to be treated between two elastic conveyor belts, one or more stages for the leather treatment, which is performed on a plurality of small areas which are adjacent to each other, wherein said treatment is characterized in that each area unit simultaneously undergoes a stretching and smoothing process, which is performed by the motion of at least one rounded tip within an opening into which the leather area unit is pushed. The perching machine suited to carry out said leather finishing process comprises a plurality of plates with pegs, which are connected with the base of the perching machine and are provided with an alternate vertical movement driven by a cam mechanism; each of said plate is opposed to a counterplate provided with holes, each of which is suited to receive each of the pegs fastened to each plate, wherein the leather to be treated, which is held between two guiding elastic conveyor belts, is caused to progress between the plates with the pegs and the drilled counter-plate, and is characterized in that each of the plates with the pegs is driven by the combined movement of a cam mechanism and of an articulated quadrilateral suited to drive each plate in an alternated vertical rotating-translating movement.

Advantageously, according to the invention a perching method for leather is developped and a perching machine is realized which is suited to perform said perching method, which makes it possible to obtain a degree of softness and handle of the leather, comparable with those which can be obtained by means of manually operated machines of the artisan type, while processing a production quantity of the industrial type.

Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific example, while indicating a preferred embodiment of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention wil become apparent to those skilled in the art from this detailed description, and from the drawings, wherein:

- Fig. 1 shows the longitudinal cross-section of the part of the perching machine of the invention, which concerns the area of the plates with pegs and their opposed drilled conterplates;
- Fig. 2 shows the magnified detail of a peg acting on the leather within the hole which is suited to receive it.

The machine according to the invention, which is indicated as a whole with 1 in Fig. 1, comprises a base supporting the perching units 3, 4, 5, 6. It will be remarked that Fig. 1 shows four perching units, but it is understood that the perching machine 1 may comprise any number of perching units. Moreover, in the description given hereafter,

reference will be made only to the perching unit indicated with 3, as far as the components are concerned, but it is understood that the perching units 4, 5, 6 comprise the same components as unit 3.

The perching unit 3 consists of a plate with pegs 7 comprising a base-plate 8 on top of which are attached the pegs 9.

The horizontal plane 10 of the base-plate 8 is parallel to a drilled counterplate 11, positioned over the plate with pegs 7 and presenting a plurality of holes 12, each of which is penetrated by a peg 9.

The plate with pegs 7 undergoes an alternated vertical movement following direction 13 which is trasmitted to it by cam 14 driven by a motor (not represented in the drawing), which by driving it through shaft 15 causes it to rotate, for instance, in the direction indicated by arrow 16.

While rotating, cam 14 goes to interfere against the lower base 17 of the base-plate 8, thereby causing it go up or down, depending on the position of its excentricity during its rotation.

Leather 20 to be treated is fed into the perching machine by arranging it horizontally between the pegs 9 and the counterplate 11.

It is held between a top elastic belt 21 and another bottom elastic belt 22 and it is sent into the machine in the direction indicated by arrow 23.

While cam 14 is revolving, the plate with pegs 7 will go up and down, so that, as a consequence, each of its pegs 9 will penetrate each hole 12 of the counter-plate 11.

It is obvious that during said vertical upward and downward movements of each peg of plate 7, leather 20 held between the guiding elastic belts 21 and 22 is forced to enter into and exit from the holes of the counterplate 11, as shown in Fig. 2.

In fact, it can be observed in Fig. 2, that the upward thrust of peg 30 following direction 31 causes leather 20, held between the top elastic belt 21 and the bottom one 22, to penetrate within hole 32. The compressing action of peg 30 against leather 20 and the rubbing caused by said peg 30 on the leather by fretting it against edge 33 when entering hole 32 and edge 34 when exiting from the same hole creates on the leather 20 being treated a stretching of its fibers and, as a consequence, a softering of the same. Since cam 14 turns at a speed of several revolutions per minute and since a plurality of pegs 9 are attached to the top surface 10 of the base plate 8, it can be understood that the number of traction and stretching actions which the leather undergoes per minute is very large. It is, in fact, this very quick sequence of tension stages followed by relaxed stages which causes a yield of the leather, which thus acquires the desired characteristics of softness and handle. It is obvious that leather 20 exits from hole 32 thanks to the elastic back-spring of the belts 21 and 22 which hold leather 20 during the downward movement of peg 30.

During its vertical ascent the base-place 8 of the plate with pegs 7 also undergoes a horizontal displacement in the direction indicated with 40 in Fig. 2. By observing Fig. 1 it can be seen that each perching unit is provided with an articulated quadrilateral 50 comprising an upper crank 51, a lower crank 52 and a drag link 53. The small end 54 of crank 52 and the small end 55 of crank 51 are aligned with each other following the vertical direction 56 and they are attached to the base 2 of the machine. On the other hand head 58 of the drag link is connected with the head 59 of the lower crank 52, while the head 60 of the drag-link is connected with the head 61 of the upper crank 51. Said heads of the drag-link and of the cranks are also connected with the base-plate 8 of the perching unit. It is the presence of this articulated quadrilateral 50 which, during the revolving movement of cam 14 and the insuing vertical movement of the plate with pegs 7, impresses to it a horizontal movement in direction 40, as can be observed in Fig. 2, although the horizontality of the upper surface 10 of the base-plate 8 is maintained.

It is the combination of these two movements, in direction 13 and in direction 40, which submit each peg 9, attached to the base-plate 8, to a combined rotating-translating movement having a trajectory which is similar to curve 70 along which the sandwich comprising leather 20, which is being treated, and the two elastic belts 21 and 22, arranges itself during the movement of peg 30.

Fig. 2 shows, in fact, peg 30, which in the position indicated with an unbroken line is in its position of maximum penetration within hole 32, while the position represented with broken lines shows the peg during its ascending stage while it is entering hole 32.

Thus, it is easy to understand that, contrary to what happens in the perching machines of the known type, the perching machine according to the invention performs on leather 20 being threated a stretching of the fibers combined with a smoothing action of its surface. In fact, as has already been mentioned, the lifting of peg 30 forces leather 20 against the edges 33 and 34 of hole 32, thereby creating a stretching action on leather 20 along stretch 71 acquiring a curve 70 and comprised between the edges 33 and 34 of hole 32. Moreover, the action of the articulated quadrilateral 50 is such as to cause a displacement in direction 40 of peg 30, which causes a smoothing effect on the surface of leather 20 and, therefore, a directional recovery of the stretched fibers. Since, as has already been remarked, the two actions in vertical direction 31 and in horizontal direction 40 are si-

multaneous, the actions of yielding of the leather and the smoothing of its surface occur at the same time and for as many times per minute as is the number of r.p.m. of cam 14 multiplied by the number of pegs 9 arranged on surface 10 of the base-plate 8 and multiplied still by the number of the perching units.

As can be observed in Fig. 1, the perching units are not always simultaneously in contact with leather 20, which is being treated and moves forward in direction 23, but they are in contact with it alternatively two by two. Thus, in the example represented in Fig. 1 the perching units which are in contact with the leather are the intermediate units 4 and 5 while the outer perching units 3 and 6 will engage the leather during the subsequent half-turn of cam 14.

On the basis of what has been described, it can be understood that all the purposes proposed by the invention have been fulfilled.

The first purpose has been fulfilled, i.e. the development of a method for leather and the realization of a perching machine suited to carry it out, so as to give leather 20, which is being treated, a high degree of softness and a "handle" which is comparable with the "handle" obtained with manually operated machines of the artisan type, which are no longer used. It has, in fact, being seen that through cam 14 and the articulated quadrilateral 50 it is possible to perform an alternated combined vertical, rotating and translating movement of the pegs 9, which very faithfully reproduces the work of the mentioned manually operated machines and which gives leather 20 under treatment the same characteristics of softness, flexibility, elasticity or more in general a good "handle".

Since the described machine carries out the process in the industrial fashion yielding high production quantities, it is understood also that the other purpose is fulfilled, i.e. the purpose of obtaining the desired above-mentioned quality characteristics while producing quantities suited for an industrial-type production.

During the construction stage changes and modifications of the machine may occur to those skilled in the art.

For instance, it is possible to vary the distances of the cranks 51 and 52 or of the drag-links 53 of the articulated quadrilateral with the purpose of changing the length of the movements in direction 40. In the same way it will also be possible to vary the excentricity of cam 14, and the number of the pegs 9 attached to the base-plate 8, their shape and their arrangement.

Nothing would change if the pegs 9 were attached to plate 11 and the holes 12 were made in plate 8. In fact, the leather would thus undergo an identical treatment.

It is, therefore, understood that said changes and modifications would not exceed the scope of the invention such as it is described in the following claims.

Claims

1) A method for perching leather comprising a working stage of continuous progress of the leather to be treated, one or more stages of treatment of the leather carried out on a plurality of small areas adjoining each other, wherein said treatment is obtained through stretching of the leather caused by pegs penetrating the holes of a counter-plate and through a subsequent relaxation of the leather following the withdrawal of the pegs from the holes, characterized in that during the stretching stage a simultaneous action of smoothing the surface of the leather occurs, said smoothing action being achieved because of the translation of the pegs within the stretching holes.

2) A perching machine (1) suited to carry out the finishing method for leather according to claim 1, comprising one or more plates with pegs (7) attached to the base (2) of the perching machine (1), provided with an alternated vertical movement (13) driven by a cam (14); each of said plates (7) is counterposed to a counter-plate (11) with holes (12) each of which is suited to be penetrated by one of the pegs (9) attached on each of the plates with pegs (7), wherein between the plates with pegs (7) and the drilled counter-plate (11) progresses the leather (20) to be treated, which is held between two guiding elastic conveyor belts, a top one (21) and a bottom one (22), characterized in that each of the plates with pegs (7) is connected with an articulated quadrilateral (50) and performs, in combination with the rotation of the cam (14), an alternated vertical, rotating-translating movement which maintains the base-plate (8) supporting the pegs constantly parallel to the plate (11) with the holes.

3) A perching machine according to claim 2, characterized in that the articulated quadrilateral (50) presents the upper crank (51) and the lower crank (52) the small ends (55, 54) of which have their rotation pivots attached to the base (2) of the perching machine.

4) A perching machine (1) according to claim 3, characterized in that the upper crank (51) and the lower crank (52) have their heads (61, 59) connected with each other by means of a drag-link (53).

5) A perching machine (1) according to claim 4, characterized in that the crank head (61) of the upper crank (51) has its rotation pivot attached to

the plate with pegs (7).

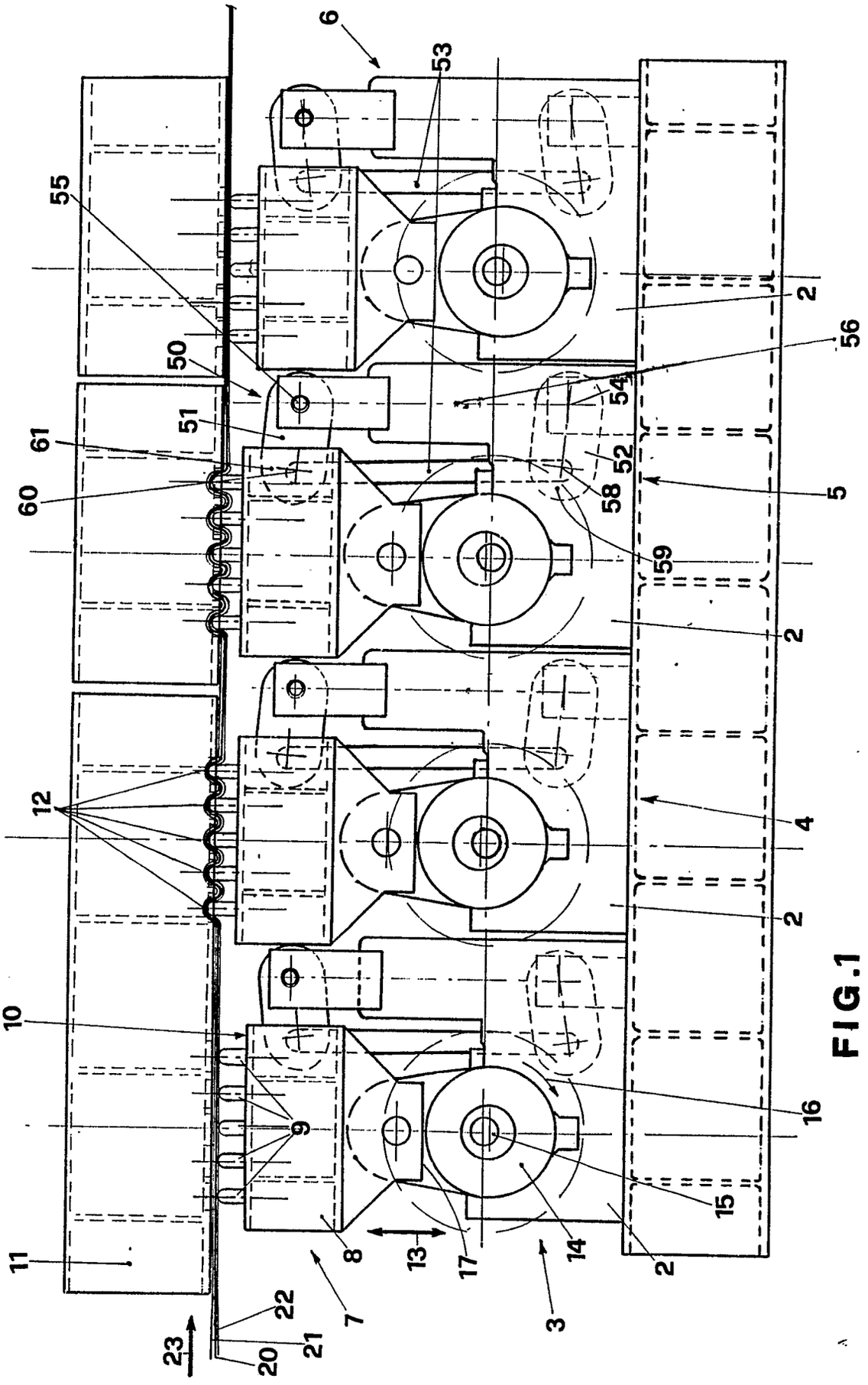
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FIG.1

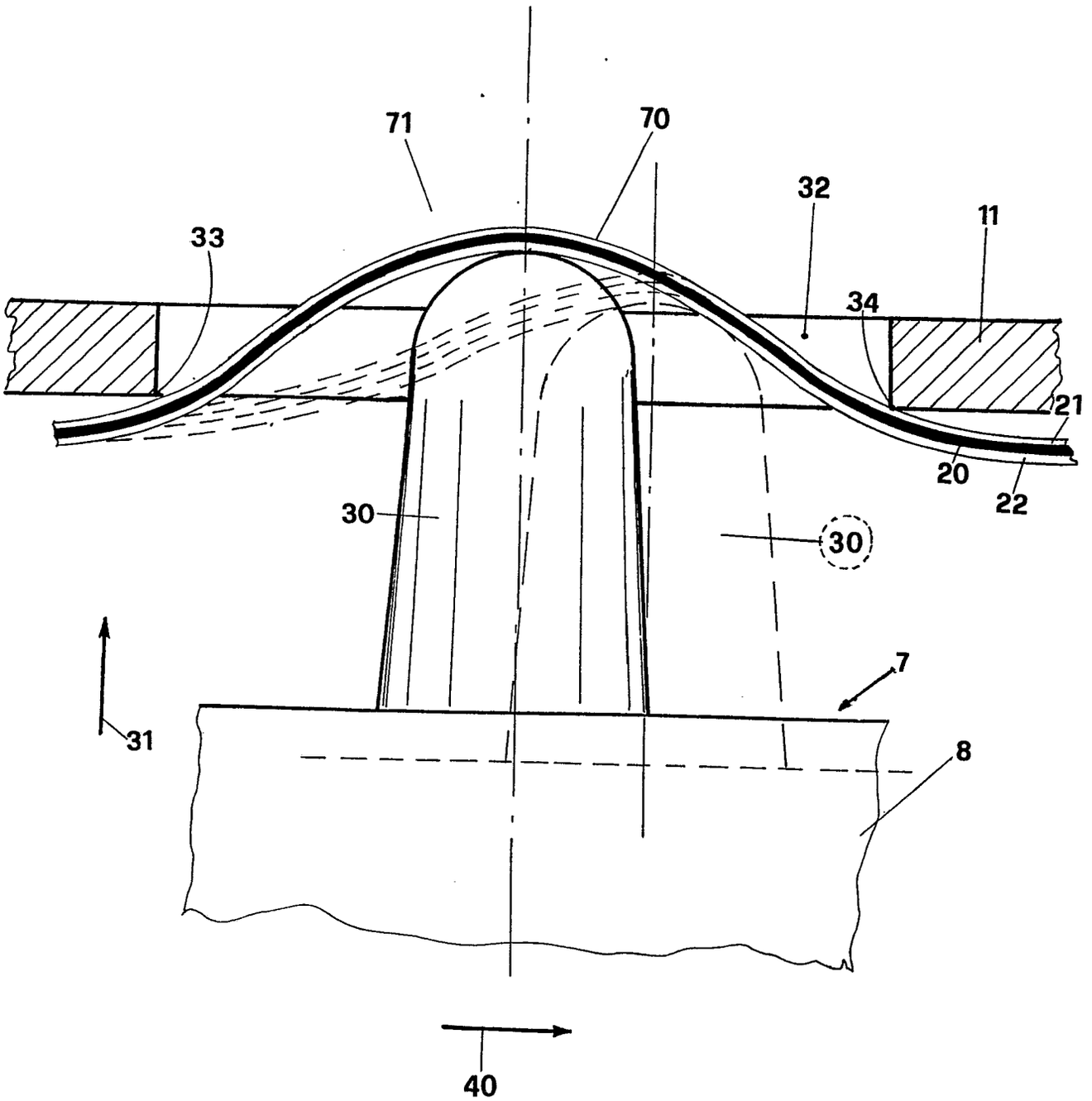

FIG.2