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Schindler et al.

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[54] **TOE-LASTING MACHINE**

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[52] **U.S. Cl.**.....**12/10.5**

[51] **Int. Cl.**.....**A43d 21/00**

[58] **Field of Search**.....12/10.5, 12, 12.4, 12/12.5, 10.1

[56] **References Cited**

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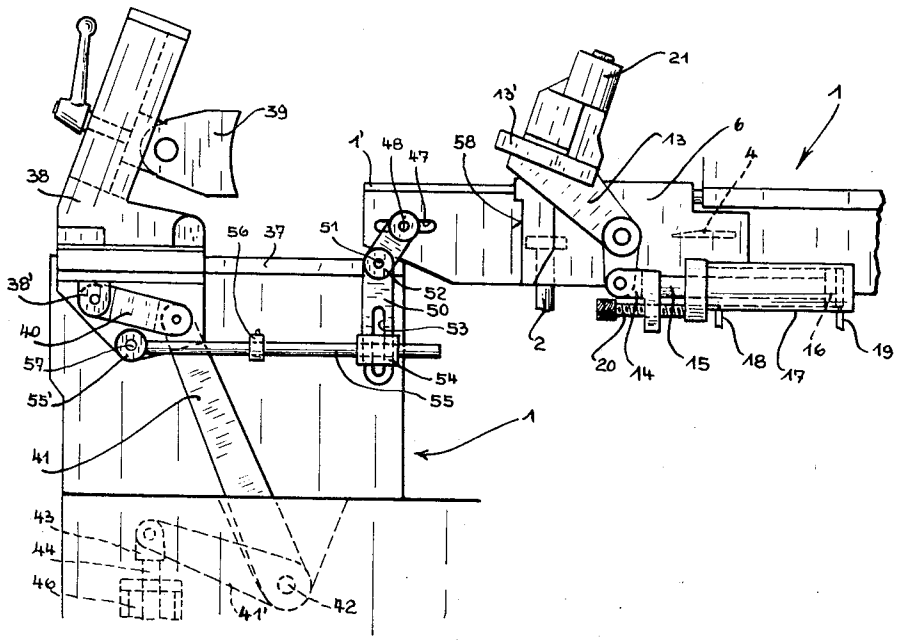
Primary Examiner—Patrick D. Lawson
Attorney—Abraham Friedman et al.

[57] **ABSTRACT**

A toe-lasting machine having wipers or tuck-in devices for an upper leather of a shoe in a joint area of a last, wherein a large part of the adjusting operations of the tuck-in devices are automatic. The toe-lasting machine includes a machine frame, a first carriage with a heel support, a second carriage with a wiper head and wipers, and a pair of support tuck-in devices. The tuck-in devices are mounted on the second carriage. An adjustable linkage system is supported on the first carriage and on the machine frame. The linkage system is set to serve as a limiting stop in cooperation with a detent associated with the second carriage which supports the tuck-in devices.

8 Claims, 7 Drawing Figures



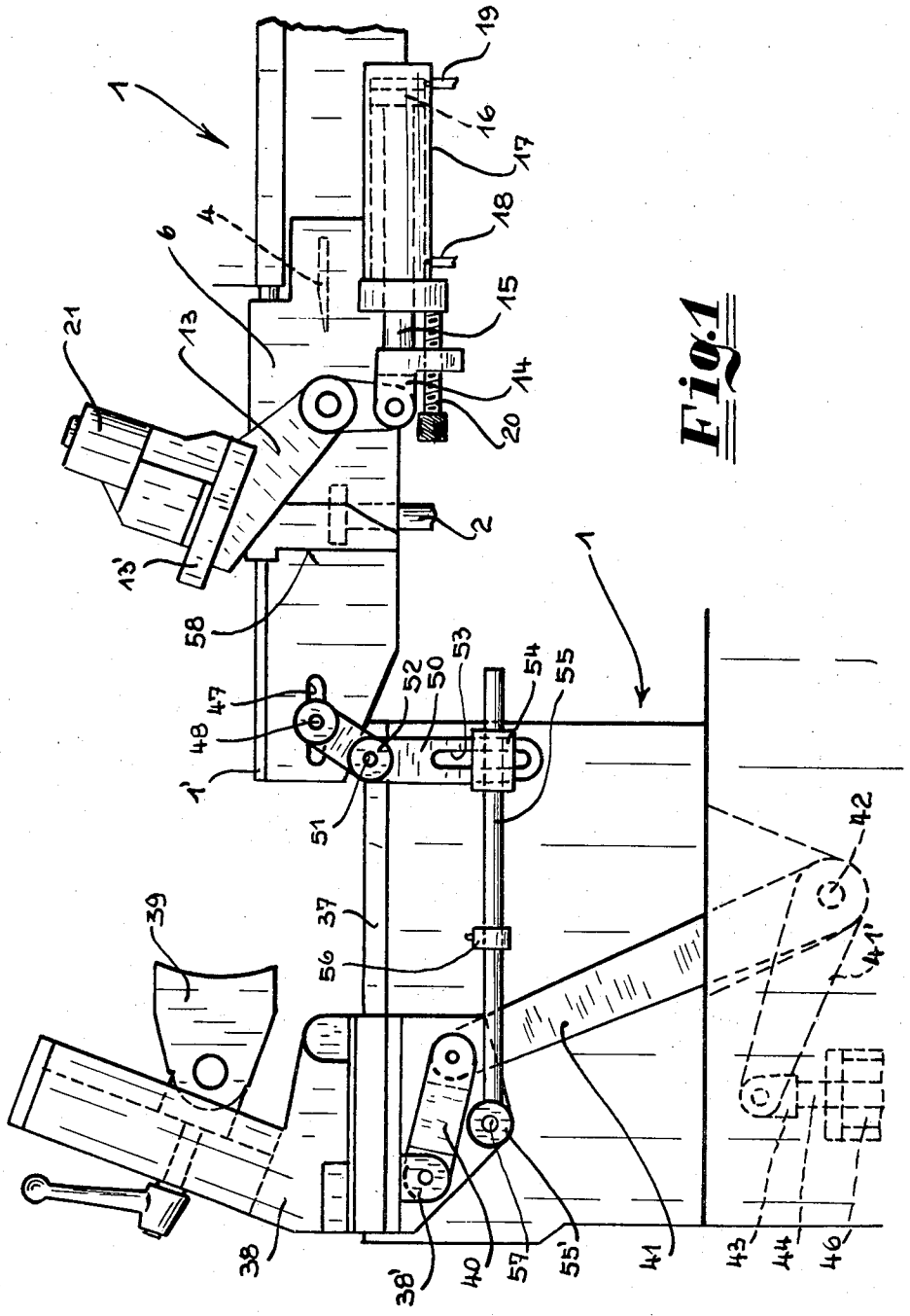

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Fig.1

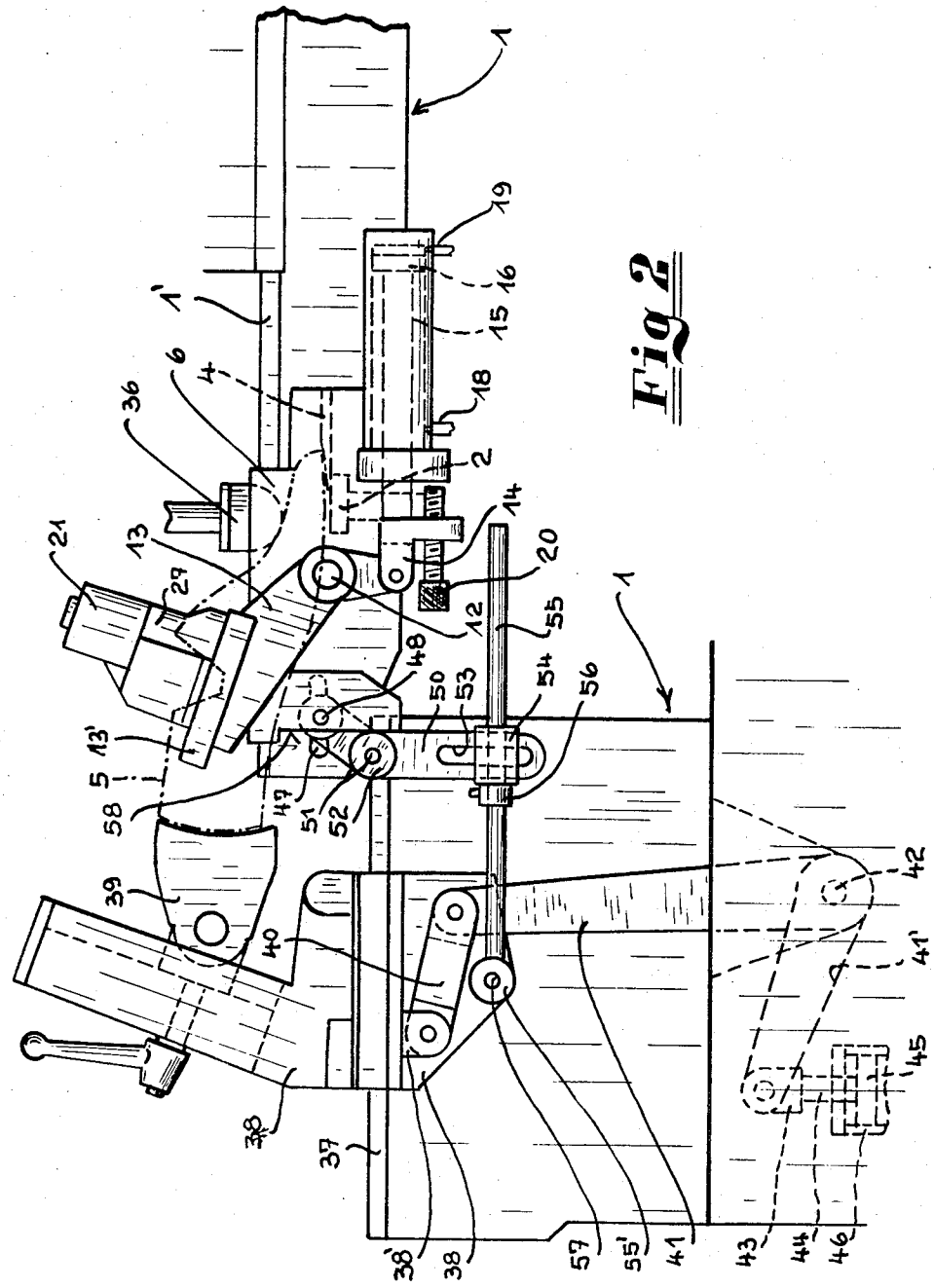
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Fig 2

Fig.3

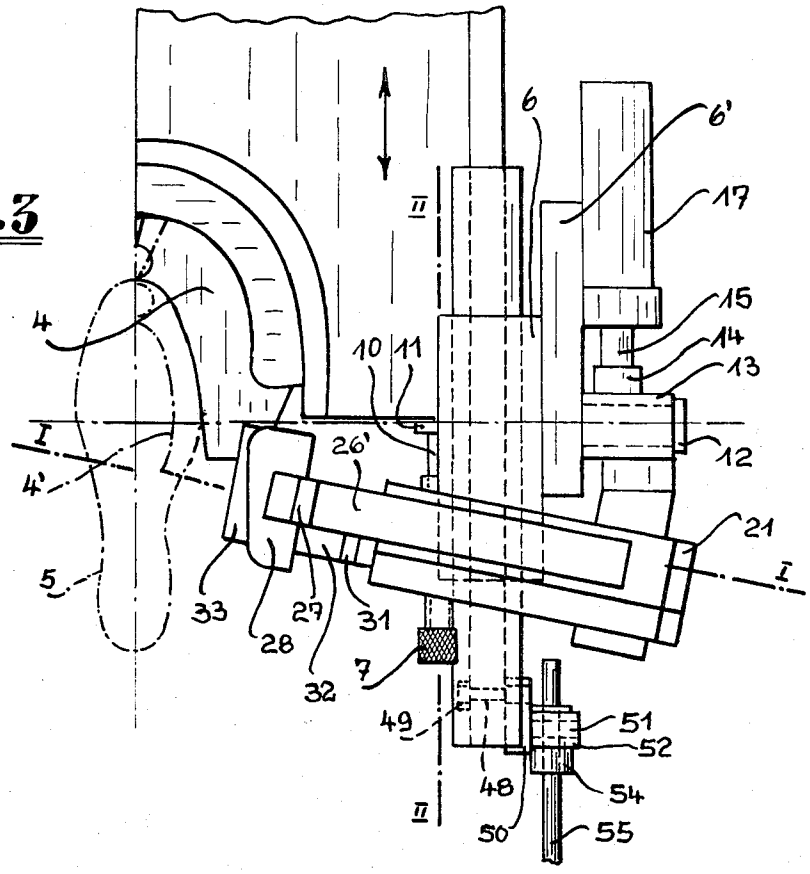
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Fig.4

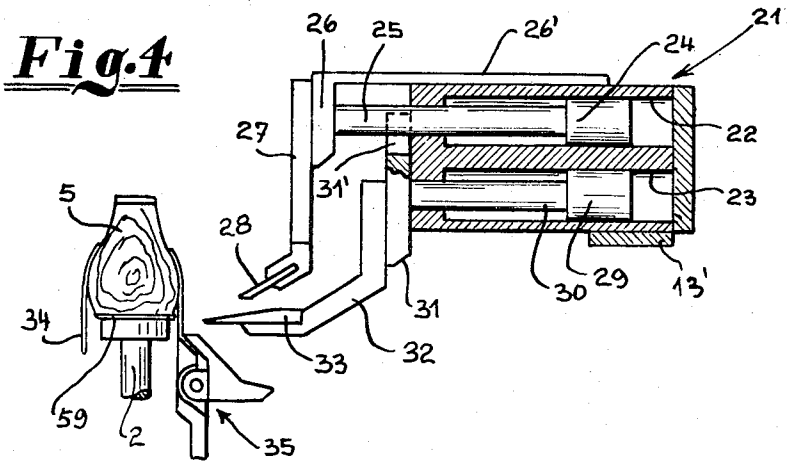
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Fig. 5

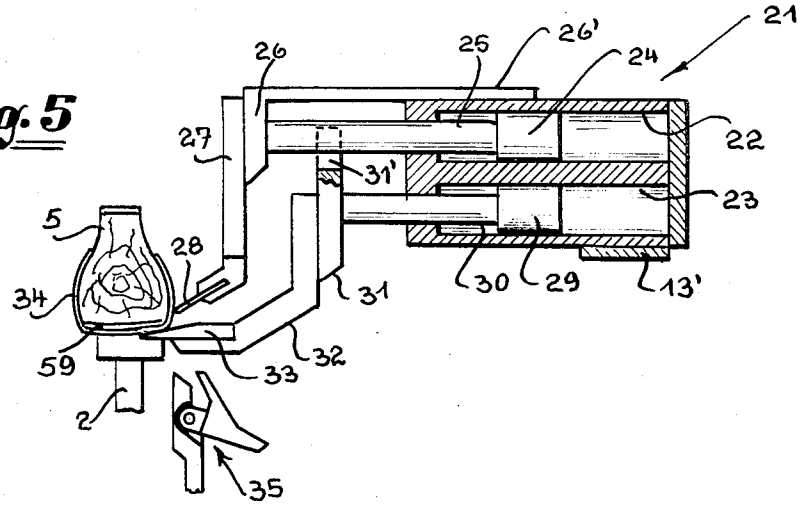


Fig. 7

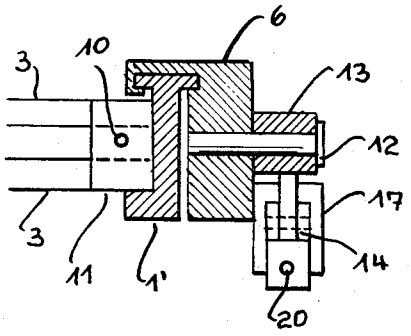
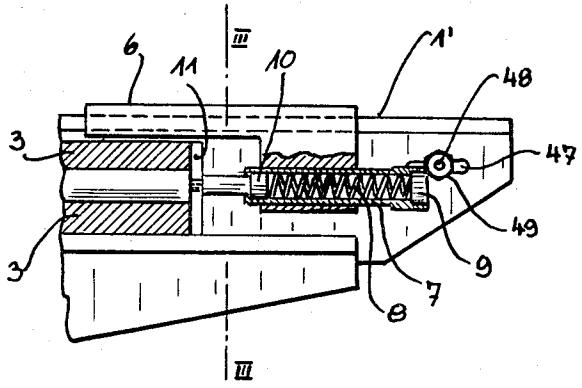


Fig. 6



TOE-LASTING MACHINE

BACKGROUND OF THE INVENTION

This invention relates to a toe-lasting machine having a carriage with a heel support, a carriage with a wiper head and wipers , and with separate tuck-in means for the upper leather of a shoe in the joint area of the last.

In the case of prior art, insertion or tuck-in devices are adjusted manually by means of screws and spindles. When making such adjustments, the different last sizes and shapes must be taken into account. Hence, proper adjustment requires great skill and is very time-consuming.

SUMMARY OF THE INVENTION

Accordingly, it is the objective of the present invention to make a large part of the adjusting operations automatic, thus simplifying the work on the machine and streamlining the same.

In accordance with the principle of the invention this effect is achieved by providing that the carriage with the wiper head and wipers also serves as mount for the insertion or tuck-in means, and the length of the last is sensed from the heel support with the aid of an adjustable linkage system including a roller attached thereto, the linkage system being pivoted on the heel support carriage and on the machine frame, so that the roller is set to serve as a limiting stop in co-operation with a detent rigidly associated with that carriage on which are mounted the insertion means. Once the machine is adjusted to a specific last size, the arrangement based on the invention ensures that the insertion means are located in a correct position relative to the joint area when the heel support comes into abutment against the heel part of the last. In one embodiment of the invention, the inventive arrangement is made adjustable in that the joint pin on the roller-carrying lever can be set in different positions along a slot in the machine frame while the location of the pivoting support can be changed along a slot in that lever, and the stop-bar is slidably guided in the pivoting support and carries a set-collar adjustable therealong.

Accurate operation of the wiper is assured by providing that the carriage is driven from the wiper carrier and supported thereon via a spring. In accordance with the invention, this spring, together with its mount, is adjustable in axial direction of the carriage. When the wiper carrier is moved by means of a motor in a direction towards the last, it propels the carriage with the tuckin device against a bias of the spring, until the carriage detent comes into abutment against the roller serving as a limiting stop. The wiper then continues its operative path alone while the carriage remains stationary.

The height adjustment of the tuck-in device, as well as of a pressure plate associated therewith in accordance with the invention, also takes place automatically; this is accomplished by means of a twin cylinder arrangement whose one piston causes the pressure plate to exert pressure against the upper leather in the joint area while the other piston carries the tuck-in device to within the joint area. The twin cylinder arrangement is supported by a lever so that it may pivot in perpendicular direction. In response to a displacement of the pistons of the twin cylinder arrangement, both the pressure plate and the insertion means come

into their operating positions; the pivoting movement makes it possible for the tuck-in device to urge the leather against the last after tucking in the same. In one embodiment of the invention the carrier arrangement for the tuck-in device and the plate have such a configuration that one piston rod carries a cross-piece with a forked member which secures it against torsional movement by abutting against the other piston rod, while the second rod is provided with a cross-piece which carries a cam groove which secures it against a torsional movement by being guided on the twin-cylinder housing.

BRIEF DESCRIPTION OF THE DRAWINGS

Having in mind the above and other objects that will be evident from an understanding of this disclosure, the invention comprises the devices, combinations, and arrangements of parts as illustrated in the presently preferred embodiment of the invention which is hereinafter set forth in such detail as to enable those skilled in the art readily to understand the function, operation, construction and advantages of it, when read in conjunction with the accompanying drawings in which:

FIG. 1 is a side view of the machine showing elements of the novel arrangement, in rest position;

FIG. 2 is a similar side view of the machine of FIG. 1 with the elements of the novel arrangement in operating position;

FIG. 3 is a top view of the machine showing part of the novel arrangement;

FIG. 4 is a section along line I — I of FIG. 3 with part of the arrangement in its initial position;

FIG. 5 is a section along line I — I of FIG. 3 with part of the arrangement in operating position;

FIG. 6 is a section along line II — II of FIG. 3; and

FIG. 7 is a section along line III — III of FIG. 6.

DETAILED DESCRIPTION OF THE INVENTION

The toe-lasting machine itself will not be described in any detail. Machines of this type have been widely known for some time. The arrangement suggested by the present invention can be readily adapted to any one of these machines.

The support of a toe-lasting machine is specifically identified by numeral 1 in FIGS. 1 to 3. At its front upper part it carries the inventive arrangement which will be described with specific reference to FIG. 3 of the drawing. The arrangement has a largely symmetrical configuration. FIG. 3 shows its right-hand portion; its left-hand counterpart is substantially identical. The description which follows relates to one of the complimentary halves of the arrangement based on the invention.

In its upper portion support 1 is provided with a forward-projecting guide-rail 1'. Wiper head 3 (shown best in FIGS. 6 and 7) slides in its guide means in a direction towards last support 2 in both directions indicated by the arrows. Wiper 4 is supported in cutter head 3; the latter, together with its wiper, is moved from its rest position indicated by a solid line into its operating position indicated by a dashed line by a piston-cylinder drive arrangement (not shown); the same drive arrangement returns it into its initial position. Last 5 rests on its support 2.

A carriage 6 slides in longitudinal direction along guide-rail 1'. Carriage 6 possesses a side-member 6' extending laterally and outwardly and serving as a mount for a knurled-head hollow screw 7 which accommodates a spring 8 abutting against plug 9 and tappet 10 (see FIG. 6). Tappet 10 is carried by a front plate 11 seated in the front portion of wiper head 3. When the wiper head 3 is moved by the piston-cylinder arrangement (not shown), its movement is transmitted to carriage 6 via tappet 10, spring 8 and hollow knurled-head screw 7. After the carriage 6 comes into abutment against a detent, as described hereinafter, the wiper head 3 can continue to advance by a certain distance against the bias of spring 8, thus compressing the latter.

Carriage 6 carries a bell-crank lever 13 on a pivot pin 12; one end of the bell crank lever 13 is engaged by a forked member 14 of piston rod 15 associated with a cylinder-piston unit 16, 17. Piston 16 is energized in cylinder 17 by means of a pressure medium issuing out of one of the pressure lines 18 and 19. The initial position of piston 16, and thus of lever 13, can be adjusted by means of a knurled screw 20 accommodated in shoulder of the forked piece 14.

On a plate 13' the bell-crank lever 13 carries a twin-cylinder arrangement 21 having two cylinder bores 22, 23. Bore 22 accommodates a piston 24 having a connecting rod 25 whose forward extremity carries a cross-piece 26; the latter serves as a support for a guide-bar 26' which runs along the twin-cylinder arrangement (see FIGS. 4 and 5), and prevents a torsional movement of connecting rod 25. Cross-piece 26 also carries a support 27 which in turn carries a pressure plate 28 on its lower extremity. By suitably energizing piston 24 in cylinder bore 22, pressure plate 28 can be moved towards the last and back again.

A piston 29, having a connecting rod 30, is accommodated in cylinder bore 23; rod 30 likewise carries a cross-piece at its other end; the cross-piece, which is identified by numeral 31, prevents a torsional movement of connecting rod 30 in that it is guided along connecting rod 25 by means of a guide-fork 31' (see FIGS. 4 and 5). A support 22 for insertion or tuck-in means 33 is attached to member 31. Depending on the mode of energizing piston 29 in cylinder bore 23, tuck-in means 33 slide in under last 5 or are withdrawn therefrom.

The upper leather 34 of a shoe is pulled tight over last 5 by means of gripper arrangement 35 (only one being shown). An insole 59 is attached to the bottom of last 5. The last 5 is fixed on its support 2 by means of a pressure pad 36 which acts upon the front of the last (see FIG. 2). In the direction of an operational axis of the device, the frame 1 carries on its upper front side another guide bar 37 along which slides back-and-forth a support carriage 38 for a heel support 39. The heel support 39 is so mounted on the carriage 38 that its height may be manually adjusted (see FIGS. 1 and 2). In a bearing bracket 38' on carriage 38 there is journalled a guide lever 40 which is connected with a bell-crank 41 supported at point 42 so as to be actuated by a piston-cylinder unit 45, 46 whose connecting rod 44 engages the other extremity 41' of bell-crank 41 by means of a forked piece 43.

At its front end guide-rail 1' (see FIGS. 1 and 2) is provided with a slotted aperture 47 threaded by a pin 48 with nut 49 for a lever 50. The latter carries a rotatable roller 52 on a journal pin 51. A slotted aperture 53 extends along the lower extremity of lever 50; a slidable support 54 may be adjustably fixed along slotted aperture 53 so that it adopts varying locations relative to pin 48.

Support element 54 is provided with a bore which slidably accommodates a stop-bar 55. A stop-collar 56 is seated on stop-bar 55 and can be fixed at any desired location therealong. A boss 55' provides a swivelling attachment for stop-bar 55 by engaging a pin 57 on carriage 38.

Carriage 6 has a fixed detent 58 located so as to limit longitudinal movement thereof by abutting against roller 52 attached to lever 50. When carriage 38 with the last support 39 comes into abutment against the heel part of last 5, stop-bar 55 acts to determine the angular position of lever 50. Roller 52 which is carried by the lever, defines the end-position for the path travelled by carriage 6 which then comes into abutment with its detent 58 against roller 52. This determines the position of tuck-in means 33 relative to last 5.

Insole 59 is attached by pins to the bottom of last 5 and then upper leather 34 is laid thereover. The last is then mounted by hand on its support 2 and the edge of upper leather 34 is manually inserted into gripper arrangement 35 located along the front of last 5. In response to a foot-operated switch the gripper arrangement closes in a conventional manner and pulls the upper leather tightly over the last.

Carriage 38 with heel support 39 is then actuated by means of piston 45 and cylinder 46, and moves along guide-bar 37 until heel support 39 comes into abutment against last 5. Stop-bar 55 participates in this movement by sliding in support element 54; it then comes into abutment thereagainst with its collar 56 and pivots lever 50 about support pin 48 until carriage 38 has stopped. This brings the roller into a position determined by the size of the last. The position of roller 52 can be adjusted by shifting pin 48 in slot 47, the position of pivoting support 54 in slot 53 and of collar 56 on stop-bar 55.

Driven by a cylinder/piston arrangement (not shown), the wiper head 3 advances until cutter 4 reaches the edge of last 5 (see FIG. 3). Driven via tappet 10, carriage 6 participates in this movement of wiper head 3 until detent 58 of carriage 6 comes into abutment against roller 52 on lever 50 (see FIG. 2). From there on the wiper head can advance alone and as a result compresses spring 8 (see FIG. 6) since carriage 6 cannot be moved any further. Together with carriage 6, the side tuck-in device 28, 33 is not in the correct position with respect to the joint area of last 5.

Conventional control means trigger the pressure medium which helps to actuate piston 24 so that pressure plate 28 comes into abutment against last 5 and presses upper leather 35 thereagainst. Wipers 4 then carry out the wiping operation and arrive into the position indicated by a dashed line 4' (see FIG. 3). Gripper arrangement 35 opens and releases the edge of upper leather 34. Tuck-in device 33 then moves into its operating position (see FIG. 5). This takes place in response to actuation of piston 29 by means of a pressure medium.

Directly prior to the tuck-in procedure the pressure pad **36** is lowered towards the front part of the last. After the edge of the upper leather is tucked-in under the insole, the edge of the upper leather must be tightly pressed together with insole **59** along the joint area. To this effect piston **16** is actuated by a pressure medium issuing through pressure line **19**, whereupon it pivots lever **13** about its support **12** via connecting rod **15** and forked piece **14**. Plate **13'** is lifted together with the twin-cylinder arrangement **21** mounted thereon; as a result, tuck-in means **33** are urged against the edge of the upper leather and the insole **59** in the joint area of last **5**. This terminates the lasting procedure and all elements return into their respective initial positions.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of the invention which is for purposes of illustration only and not to be construed as a limitation of the invention.

What is claimed is:

1. A toe-lasting machine including a machine frame, a first carriage with a heel support, a second carriage with a wiper head and wipers, and a pair of separate tuck-in means for a joint area of an upper leather of a shoe characterized in that

said second carriage on which is mounted said wiper head and said wipers also carries said tuck-in means, a length of a last is sensed from said heel support with aid of adjustable linkage means including a lever carrying a roller, said linkage means being supported on said first carriage with said heel support and on said machine frame, said roller being set to serve as a limiting stop in cooperation with a detent rigidly associated with said second carriage which supports said tuck-in means.

2. A toe-lasting machine according to claim **1**, wherein said second carriage is propelled by said wiper head and is supported thereagainst via a spring.

3. A toe-lasting machine according to claim **2**, wherein said spring together with its mount are adjustable along said second carriage.

4. A toe-lasting machine according to claim **1**, wherein a pin supports said lever which carries said roller, said pin being adjustably accommodated in a slotted aperture in said machine frame, a support being slidably accommodated in a slotted aperture in said lever, a stop-bar being slidably accommodated in said support, said stop-bar carrying a collar adjustable therealong.

5. A toe-lasting machine according to claim **4**, wherein said second carriage is propelled by said wiper head and is supported thereagainst via a spring.

6. A toe-lasting machine according to claim **5**, wherein said spring together with its mount are adjustable along said second carriage.

7. A toe-lasting machine according to claim **1**, wherein a twin-cylinder arrangement includes a first piston assembly carrying a pressure-plate for urging the upper leather against the last in the joint area and a second piston assembly carrying said tuck-in means within the joint area, and a bell-crank lever carrying said twin-cylinder assembly so that the latter is perpendicularly pivotable.

8. A toe-lasting machine according to claim **7**, wherein a connecting rod of said second piston assembly carries a cross-piece with a guide-fork which prevents its torsional movement by bracing it against a connecting rod of said first piston assembly, said first piston assembly rod being provided with a cross-piece which carries a guide-bar securing it against a tortional movement by bracing it against a housing portion of said twin-cylinder arrangement.

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