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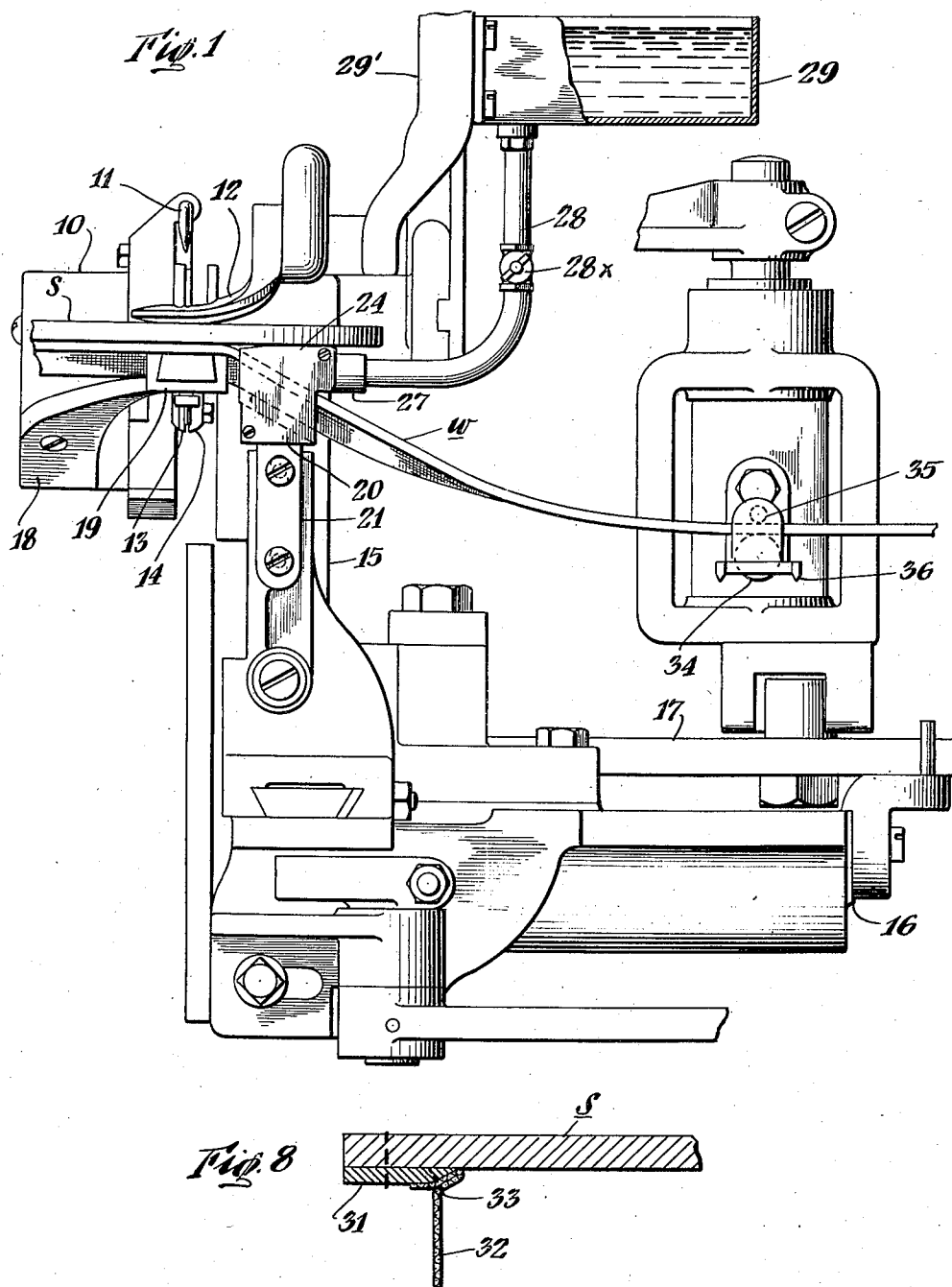
W. C. CARD, JR

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FLUID APPLICATOR FOR STITCHING MACHINES

Filed June 24, 1937

2 Sheets-Sheet 1



INVENTOR
William C. Card, Jr.
BY
Watson, Bristol Johnson & Leavenworth
ATTORNEYS.

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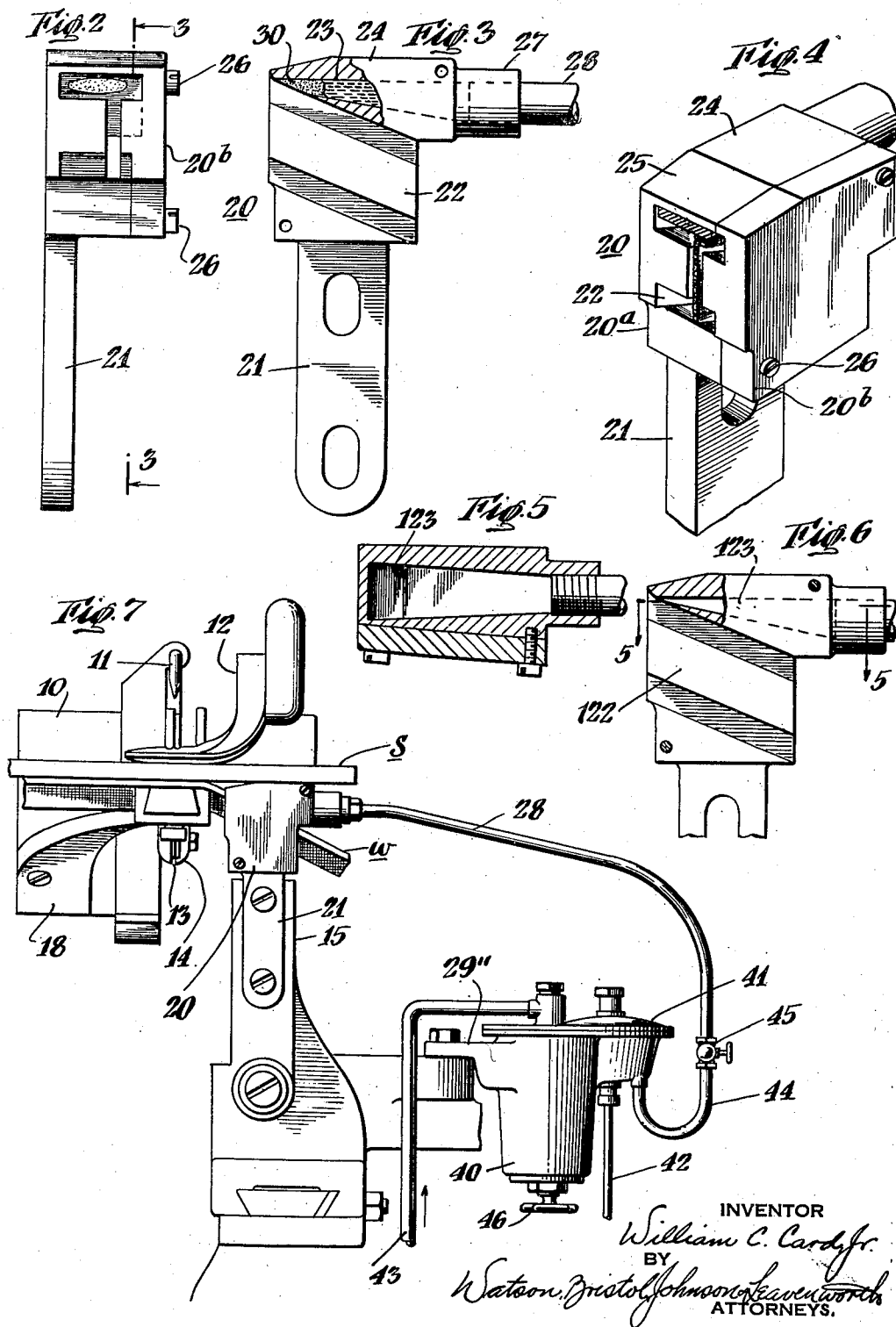
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UNITED STATES PATENT OFFICE

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FLUID APPLICATOR FOR STITCHING
MACHINES

William C. Card, Jr., Winthrop, Mass., assignor
to Compo Shoe Machinery Corporation, Boston,
Mass., a corporation of Delaware

Application June 24, 1937, Serial No. 150,051

6 Claims. (Cl. 112—43)

This invention relates to apparatus for applying cement and the like to welting in the art of shoe manufacturing, and has for its object generally the provision of suitable apparatus for rendering a welt adhesive, whereby the welt strip when stitched in place on the edge of an outsole has an intervening layer of adhesive that adds substantially to the strength of the joint between the welt and the outsole.

The herein disclosed procedure whereby cement or an activator therefor is applied in a fluid condition at an instant immediately prior to the stitching operation, so that the stitching serves to press and hold the parts in place during the subsequent hardening of the cement, and so that the cement may seep or be carried into the thread holes where it strengthens the stitches, is claimed in my divisional application Serial No. 321,959, filed March 2, 1940.

Another object of the present invention is to provide a device suitable for attachment on conventional stitching machines whereby the adhesive agent may be applied to the welting being stitched in place without reorganizing conventional stitching operations.

Still another object is to provide a device which when attached is convenient of inspection and repair and is adapted to have adhesive applied thereto in any convenient manner.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements, and arrangements of parts, which will be exemplified in the construction hereinafter set forth and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a fragmentary view, mainly in elevation but with parts broken away, showing a conventional welt stitching machine provided with a device for guiding and cementing a welt strip to be stitched in place, in accordance with the invention;

Fig. 2 is an enlarged front elevational view of the solvent or cement applying device of the present invention removed from the stitching machine;

Fig. 3 is a side view of the device shown in Fig. 2, with one section of the block removed,

taken substantially along line 3—3 of Fig. 2, part thereof being broken away;

Fig. 4 is an enlarged perspective view showing the construction employing complementary sections to form the block portion of the device shown in Fig. 2;

Fig. 5 is a sectional view of another form of the device especially adapted for cement extrusion, taken on the line 5—5 in Fig. 6;

Fig. 6 is a view corresponding to Fig. 3, but showing the device of Fig. 5;

Fig. 7 is a fragmentary view showing a portion of the machine shown in Fig. 1 but provided with a modified form of cement supplying means; and

Fig. 8 is a fragmentary sectional view showing on an enlarged scale, as the article produced in accordance with the invention, a shoe portion comprising a sole with a welt strip attached.

In the art of manufacturing shoes, it has been proposed to make so-called cemented shoes in a manner resembling Goodyear welt shoes in appearance, in which a welt strip is secured to the flesh side of an outsole and has a lasted upper cemented to a suitable cementable surface provided thereon. One suitable method for making such an article is set forth in Gorman Patent No. 2,092,350, issued September 7, 1937. It is known that the cement thus employed in shoe manufacture serves not merely as an attaching agent but also, as a strengthening means for the materials employed.

In accordance with the present invention, cement is applied to the adjoining faces or interfaces of a welt strip and an outsole, which are stitched together prior to the attachment of the lasted upper. To this end, a layer of activated cement is applied, either to the strip of welting at a point just prior to the point where stitches are made, or to the edge of the outsole where the welt strip is being put in place, or to both. In a practical embodiment of the invention, it is found advantageous to apply or activate the cement only to the welt strip at a point immediately in advance of the stitching point.

A convenient embodiment of apparatus for the practice of this step of applying cement comprises incorporating a cement applicator in a welt strip guide that is disposed at a point in advance of and adjacent to the stitch forming mechanism.

Referring now to the drawings, and more particularly to Fig. 1, there is illustrated a conventional stitching machine of a character adapted to attach so-called "false welts" to outsoles,

that is provided with a cement applying or activating device, in accordance with the invention. The machine illustrated, by way of example, is of the type shown and described in Letters Patent of the United States No. 473,870, dated April 26, 1892, issued in the names of Z. T. French and W. C. Meyer, and comprises a frame 10, in combination with a curved hook needle 11, a presser foot 12, an awl 13, and an awl segment 14. The frame is formed with an upright 15 which carries the awl segment and has mounted thereon a feed slide 16 and a feed changing lever 17, all substantially as shown in the French and Meyer patent above referred to. The work is supported by means of a bracket or shank portion 18 that is secured on the frame of the machine substantially as shown in Letters Patent No. 1,142,119, dated June 8, 1915, and issued in the name of Prenzel. The work underlying portion of this support comprises a forwardly extending enlargement 19. By such an arrangement, a suitable surface is provided for supporting a flat sole *s* in a position for having a welt, as shown at *w*, attached. These parts all have well-known constructions, and are shown by the patents above referred to. Reference to the same should be had for further details.

At the right of and suitably adjacent to the housing 19, there is cooperatively disposed a device 20 for guiding the welt and applying the cement, as herein provided. Details of the device are shown in Figs. 1 to 4. While the device may have any suitable form and be attached in any suitable manner, an advantageous form comprises a channeled block as shown, that conveys the welt to its proper position and has a bracket 21 for attaching the same to a suitable part of the machine, such as upright 15. The channel in the block is shown at 22 and has a form adapted to bring the cement receiving side of welt *w* against the flesh side of sole *s* for attachment by stitching. To achieve this readily, the block is made of two recessed complementary sections 20a and 20b that fit together to provide a channel that has a somewhat I-shaped form in cross section and passes diagonally through the block to convey the welt strip to the desired position and has cement applying means disposed adjacent the exit of the channel. The applying means here comprises a laterally extended and somewhat attenuated channel 23 that merges into the channel 22 adjacent the exit; there being no wall between the channels in the regions of the merger. The upper surfaces of the block sections 20a and 20b are preferably made even and plane, as shown at 24 with a chamfered edge as shown at 25, in order to provide additional support for the work.

The outer or minor block section 20b is preferably made independent of the bracket and removable from the major block section 20a. To this end, two or more screws, as shown at 26, are arranged to pass through the outer section to secure the same to the major section. The channel 23 is preferably confined to the major section which has a nipple 27 and a pipe connection 28 for supplying cement or a cement activating agent. This supply may be had from any suitable source, such as a tank or reservoir 29 that is disposed at a convenient point on the frame of the machine, for example, by mounting the same on the machine by means of a bracket, as shown at 29'. In such instance the tank is mounted at a height such that the sup-

ply of cement or activating agent is maintained by a gravity feed.

In the attenuated exit of the channel 23 and extending entirely across the area where the channels 22 and 23 merge is disposed an applicator 30 for cement or a cement activator. This may be a body of any suitable material such as absorbent cotton or piece of felt that is capable of absorbing but exuding when contacted the cement that is to be applied. Any suitable cement may be employed, for example, pyroxylin. The activator may likewise be any suitable agent, for example, a solvent for pyroxylin. When such solvent is used, the welt will have been previously coated with cement, which is allowed to dry before its entry into the stitching machine.

As is shown in Figs. 5 and 6, when wet pyroxylin cement or other suitable adhesive is to be applied to the welt directly before the stitching operation, the applicator 30 may be omitted and the fluid channel shaped as shown at 123, with a flattened cross-section near the place where it merges with channel 122. This section of channel 123 is shaped to merge with channel 122 along a narrow elongate orifice that is dimensioned to extrude a band of cement of desired thickness and width. When the welt is pre-cemented, however, it is preferable to use the applicator equipped block of Figs. 1 to 4, because of the serious nature of most cement solvents. In this case, the fluid dispensing orifice may be somewhat larger, as shown.

The welt strip *w* is of the composite type and comprises a leather portion 31 adapted to form the welt proper, when attached to a sole *s*, as shown in Fig. 8, and an attaching fabric portion 32, the latter being preferably stitched to the former by means of a thread, as shown at 33. The supply of welting to be fed to the device 20 is preferably provided by winding on a reel stitched and folded welt portions of the character indicated. The portions when unreel unfold as they enter the channel 22, the leather portion remaining horizontal and extending into the side channels of the top of the I-formation. The fabric portion of the welt strip depends into the vertical portion of the channel which corresponds to the stem of the I. The side channels of the bottom of the I-formation afford suitable clearance for the lower edge of the fabric portion as it is drawn through the channel 22.

It is seen that the construction of the block portion of the device 20 which employs two complementary sections, one of which is removable, permits the ready machining and assembly of parts, and affords access to the welt strip in case of tangling or jamming, since all that is required is the taking off of the removable side when access may be had to the channel 22 together with the welt strip that is passing through the same.

The stitching machine here shown is also preferably provided with an arm 34 at its upper side having a pin 35 beneath which the welt strip *w* may be passed as it is led from the welt reel (not shown in the interests of clearness of illustration in the drawings) to the device 20 and the stitching mechanism. The forward end of the arm 34 is likewise provided with conventional sole marking elements 36, suitably spaced.

In operation, when the tank or reservoir 29 has been properly filled with cement or solvent and the valve 28a opened so that a supply of fluid

enters the channel 23 and impregnates the applicator 30, then the unfolded welt strip may be threaded through the guide channel 22. The leather portion 31 as a result passes in contact with the applicator 30 and then emerges from the device 20 and projects against the under or flesh side of an outsole 8 for attachment thereto by a stitching operation.

It is seen from this that the upper side of the leather portion of the welt strip has contact with the applicator 30 substantially over the entire area where the channels 22 and 23 merge. The applicator in consequence exudes fluid while in contact with such side of the leather portion of the welt strip and applies a thin layer or coating thereto as it emerges from the device 20. This coated portion comes immediately into contact with the under side of the outsole and is then stitched in place.

Since it is seen that the stitching operation takes place at an instant succeeding the application or activation of the cement, it will be appreciated that it is still fluid and plastic and has not become set. As a result, the cement also flows into the holes made by the awl and, if a suitable wax-free or cement compatible thread is used, impregnates the thread when stitched into place by the needle. The joint between the welt strip and the outsole thus formed when the cement has set and dried is accordingly rendered relatively strong and secure, the stitching being strengthened by the impregnating cement.

While the supply of cement or solvent to the applying means may be an elevated tank or reservoir, it will be readily understood that such a supply may not always be desired or convenient, as it may be advantageous to have the cement led from a point below the stitching mechanism. In such instance, a pump for lifting the fluid may be employed. Such pump may supply fluid to one or more stitching machines; also it may be mounted on the frame of the machine at a relatively low point and driven from any convenient source if power, such as from the prime mover which drives the machine or from an independent source of power.

A modification of the machine shown in Fig. 1 embodying means for supplying cement or solvent employing a pump is shown in Fig. 7. Here, a bracket 29'' is arranged to mount a suction chamber 40 of the pump at a suitable point on the frame 10; the point shown being a little below the cement applying device 20. A piston chamber 41 adjoins the suction chamber 40 and has a piston rod 42 for actuating the piston which may be of the diaphragm variety. A suitable lift-pipe 43 conveys the fluid from a suitable well or container to the suction chamber 40. An exit pipe 44 conveys the fluid under pressure from the piston chamber 41 to a valve 45 that has the pipe 28 of the fluid applying device attached. Such pump may conveniently have a valve-like device 46 for regulating the flow of cement while being pumped.

The operation of this form of device is similar to the device described in connection with Fig. 1 except that the head of pressure on the supply of cement or solvent is maintained by means of the constantly operated pump rather than by a gravity-feed supply. By reason of the fact that the pump is constantly operated, it is advantageous to have the pump normally operate to supply cement or solvent at the greatest pressure ever to be employed in operation and utilize the device at 46 for reducing the pressure or rate of

flow to that desired, whereby the supply of cement may be accommodated to various working conditions.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination with a machine having a mechanism for stitching welting to an outsole, of a device having a passage for guiding a strip of welting into engagement with the flesh side of an outsole preparatory to a stitching operation, said device being composed of separable members which when separated afford access to said passage, means for supplying an adhesive agent, a second passage in said device communicating with said supplying means and merging into said welt guiding passage, and a fluid applicator in said device disposed where said passages join for applying a coating of the adhesive agent to the welt strip when passing to be stitched to said outsole.

2. The combination with a machine having a mechanism for stitching welting to an outsole, of a block-like device disposed adjacent the stitching mechanism, said device having a passage therethrough of a shape adapted to guide a strip of welting into a position against the flesh side of an outsole preparatory to a stitching operation and composed of major and minor portions capable of being separated and affording access to the welt guiding passage, a second passage in the major portion of said device merging into the first named passage adjacent the exit thereof, means for supplying cement in a fluid condition to said second passage, and an applicator capable of absorbing cement disposed in the region of the merger of said passages for applying a coating of cement to an exposed surface of the welt strip in its passage to be stitched to an outsole.

3. The combination with a machine having a mechanism for stitching welting to an outsole, of a block-like device disposed adjacent the stitching mechanism and provided with a passage having a somewhat I-shaped cross-section for guiding an unfolded strip of composite welting into a position against the flesh side of an outsole preparatory to a stitching operation, said device being composed of major and minor portions capable of being separated and affording access to the guiding passage and the strip of welting that may be therein, a second passage confined chiefly to the major portion of said device and merging into the first named passage adjacent the exit thereof, means for supplying cement in a fluid condition and under a suitable pressure to said second named passage, and a body of material capable of absorbing cement disposed in said second named passage and extending across the area where said first and second named passages merge and adapted to apply a coating of cement to the adjacent surface of the strip of welting while in passage to a position to be stitched to said outsole.

4. The combination with a machine having mechanism for stitching welting to an outsole, of a device disposed in advance of said stitching mechanism, said device having a passage for

- guiding a free strip of welting obliquely toward and into flat lying engagement with an outsole in the vicinity of said stitching mechanism, means for supplying adhesive agent to said device, and means in said device for applying a coating of said agent to the side of said welting which is engageable against said outsole while such welting is spaced from said outsole in its obliquely guided position.
5. The combination with a machine having mechanism for stitching welting to an outsole, of a device having a sole engaging surface bearing against one side of an outsole in the vicinity of said stitching mechanism, said device having a welting guiding passage extending obliquely therethrough toward its sole engaging surface and arranged to deliver free welting in flat lying relation against an outsole bearing against such surface preparatory to a stitching operation, said device having a second passage communicating with said guiding passage and disposed between such guiding passage and said sole engaging surface, and means for delivering adhesive agent to said second passage for deposit on the sole engaging face of said welting prior to a stitching operation.
6. The combination with a machine having a mechanism for stitching welting to an outsole, of a device having a passage for guiding a strip of welting into engagement with the flesh side of an outsole preparatory to a stitching operation, said device being composed of separable members which when separated afford access to said passage, means for supplying an adhesive agent, and said device having a second passage communicating with said supplying means and merging into said guiding passage at an adhesive agent applying orifice disposed adjacent the sole engaging side of said welting.

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