

Sept. 16, 1947.

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2,427,354

SHOE LAST

Filed Jan. 24, 1945

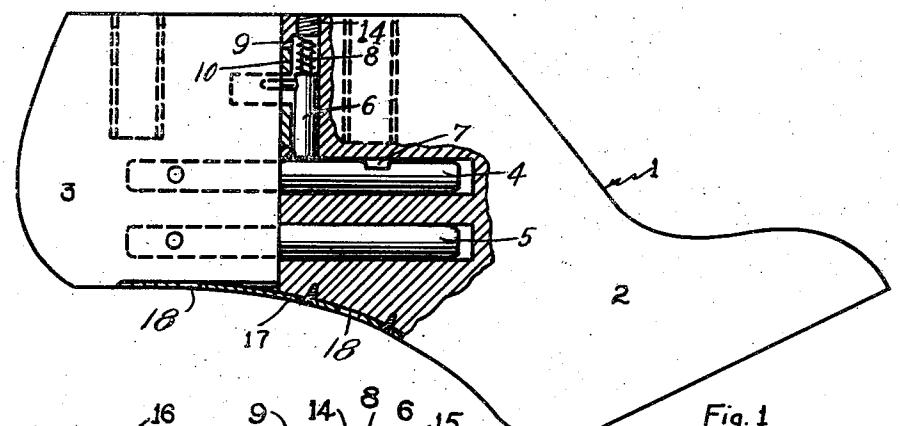


Fig. 1

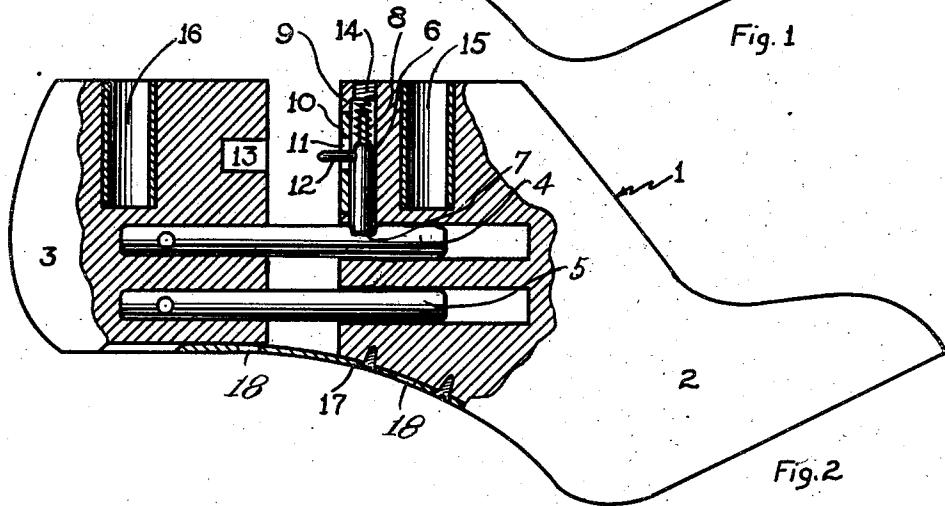


Fig. 2

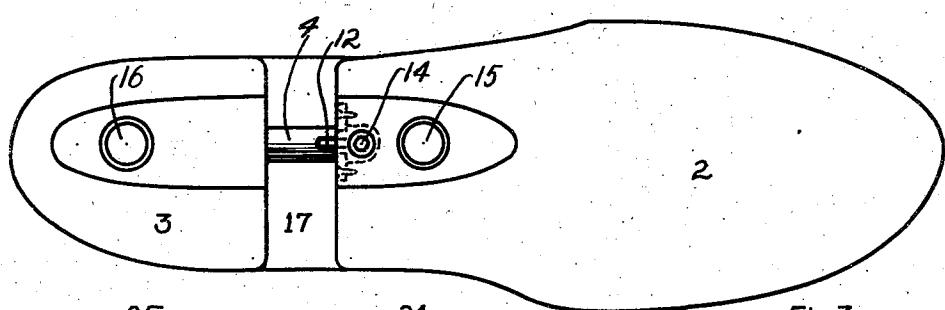


Fig. 3

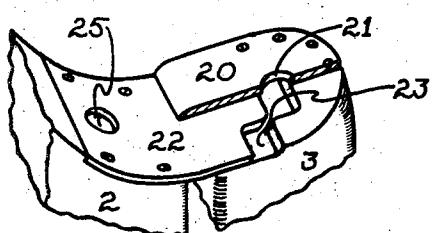


Fig. 4

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UNITED STATES PATENT OFFICE

2,427,354

SHOE LAST

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Application January 24, 1945, Serial No. 574,276

13 Claims. (Cl. 12—135)

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This invention pertains to an improvement in the manufacture of footwear and more particularly to a last upon which shoes can be supported during the manufacture thereof, such last being so constructed and arranged as to facilitate its introduction into a shoe and its removal therefrom.

The copending application for United States Letters Patent, filed August 15, 1944, under Serial Number 549,560 by Jacob S. Kamborian discloses several forms of lasts and specifically points out the advantages of the use of such lasts in connection with the lasting of the so-called "force-lasting" type of shoe. The last embodying the present invention is also adapted for such use, as well as other uses, but differs from the lasts of that application in certain respects as will be set forth below.

The primary object of this invention is to provide a last comprising a forepart member and a heel part member such members being longitudinally separable, freely movable from the closed position to the opened position, and positively held in the opened position by a manually operable mechanism which when desired will permit the complete separation of the members, and the replacement of either member should the occasion arise. This property is of particular value in lasts for women's shoes since it is well known in the shoe industry that, although the styles of women's shoes change rapidly, such changes are at the forepart only, the contour of the heel being unchanged. Hence with lasts embodying this invention, when the style is changed, it is merely necessary to prepare new forepart members and substitute them for the forepart members of the present lasts. Consequently the investment required of manufacturers in lasts, as well as the amount of material, usually wood, employed in making the lasts have been materially reduced over the present practice of making entire lasts every time a change in style is called for. Moreover, there is a saving of material when the last is made initially since it is turned in the closed position and the forepart and heel part members thereafter cut apart.

A further object of this invention resides in the provision of means by which the tread area of the last is continuous when the members are separated in the opened position. Since the lasting operation upon the shoes takes place when the shoes are supported upon the last in the opened position, the provision of such means avoids the possibility that a portion of the shoe sole might be forced to enter such space during the lasting

operation, thus injuring or marring the inner surface of the sole member. Moreover, since the members are moved into the closed position while the shoe is supported upon the last, the provision of such means reduces to a minimum any pinching of the sole during the approach of the members.

Another object of this invention resides in the mounting of the member holding mechanism so that the manually operable portion thereof projects into the space between the members when the last is in the opened position to be readily accessible for actuation from the top of the last and into a recess formed in one member when the last is in the closed position. It will be noted that this mechanism is entirely within the contour of the last so that it does not interfere with the lasting operations.

Other objects of this invention will be apparent from a consideration of the following description and of the drawings which form a part thereof and in which:

Fig. 1 is a view in side elevation of a last embodying this invention in the closed position, parts being broken away to disclose elements normally hidden;

Fig. 2 is a similar view of the last in the opened position;

Fig. 3 is a top plan view of such last in the opened position; and,

Fig. 4 is a bottom plan view taken in perspective of the rear end of another last embodying this invention.

The last 1 selected as an illustration of this invention comprises a forepart member 2 and a heel part member 3, connected by a pair of bars 4 and 5, rigidly fixed to one member and on which the other member is slideable. As shown in the drawing, one end of each of the bars 4 and 5 is fixed to the heel part member 3 and the other end is received by a bore in the forepart member 2, whereby the latter is slideable toward and from the member 3, being guided by the bars. The bars are in a common vertical plane thereby holding the members against any relative twisting movement. This has been found to be of great importance because of the tendency of the members to get out of alignment particularly during the lasting operations.

The last is held in the opened position (Fig. 2), by locking mechanism which comprises a bolt 6 yieldably held in engagement with a notch 7 in the bar 4 by a spring 8. The bolt 6 and spring 8 are mounted in a pocket 9 cut in the rear face of the forepart member 2 and closed by a remov-

able plate 10. Fixed to the bolt 6 and projecting outwardly through a slot 11 in the plate 10 is an arm 12. The free end of the arm 12 is readily accessible when the last is in the opened position and is received in a recess 13, formed in the front wall of the heel part member 3, when the last is in the closed position. An adjustable screw plug 14 bearing against the upper end of the spring 8 maintains the desired tension in the locking mechanism. The bolt 6 and notch 7 are so formed that when the last is in the opened position, the members are positively held against movement either toward or from each other.

The forepart member 2 and the heel part member 3 are provided with spindle sockets or thimbles 15 and 16 adapted to receive the spindles (not shown) upon which it is customary to support the last e. g. the spindles of a machine for shifting the members between the closed and opened positions. It will be understood however that, if desired, the last may be supported upon a single spindle inserted in one of the sockets, usually the socket 15 and the last opened or closed manually.

The latching mechanism need be actuated only when the last is in the opened position, at which time the arm 12 is readily accessible to the operator, by a suitable tool (not shown), preferably one having a hole or loop in one end which can be slipped over the end of the arm. It will be noted that no part of the latching mechanism projects at any point beyond the contour of the last so that it will not, in any respect, interfere with the handling of the last during the usual lasting operations.

The last 1 in the closed position, (Fig. 1) is introduced into the shoe to be lasted and the members 2 and 3 are then separated to shift the last into the opened position (Fig. 2) in which the members are automatically locked by the latching mechanism. Such separation can be carried out manually by the operator or by suitable mechanism prepared for that purpose. After the shoe has been lasted the arm 12 is tripped and the members 2 and 3 are brought into contact thus restoring the last to its closed position. The lasted shoe can thereupon be removed from the last without difficulty and any danger of wrenching or straining the shoe is eliminated. The space between the members 2 and 3 when the illustrated last is in the opened position is of the order of one-half inch. This distance was selected as providing a reduction in the length of the last which will permit its ready introduction into a shoe and removal therefrom while insuring solidity of the last in the opened position. It will be understood that if desired distances less or greater may be provided. However, whatever distance is selected will be the same in each last regardless of sizes.

In order to close the space between the members 2 and 3 at the bottom surface of the last when the last is in the opened position a plate 17 is secured at one end to the bottom of the forepart member 2, the free end of the plate 17 resting against the bottom of the heel part member 3. One or more holes 18 may be provided in the bottom plate 17 to permit the tacking of the insole required in the manufacture of certain types of shoes. The plate 17 is of a thickness sufficient to impart rigidity and to resist bending under the impact of blows upon the sole during the lasting or sole laying operations upon the shoe. The plate 17 is seated in depressions formed in the bottom surfaces of

the members and its free end is faced off at its upper surface to reduce to a minimum the depth of the depression in the heel part member which receives the free end of the plate. Such depression is exposed only when the last is in the opened position and is filled when the last is in the closed position. It will be noted that the plate 17 is of such dimensions that it is in contact with the sole at the heel of a shoe throughout the greater part of its surface except at the side and rear edges thereof. This is of advantage in that, when the last is returned to its closed position, only the edges of the heel part member move over the shoe sole, the forepart member and the plate being stationary with respect to the shoe.

Replacement of the forepart member 2 is made without difficulty, the last being moved into the opened position and the bolt 6 then being raised to permit the member 2 to be drawn off the bars 4 and 5. The new forepart member has been provided with the necessary bores to receive the bars, a pocket to receive the latching mechanism, and a depression to receive the bottom plate. The latching mechanism and the bottom of the member being replaced plate are easily transferred to the new forepart member before assembling.

In Fig. 4 is illustrated another last which differs from the last previously described with respect to the bottom plate. The tread of the heel part member 3 is covered by a plate 20 rigidly secured thereto in the usual manner and having a hole 21 therein through which tacks to secure the heel of the insole may be driven into the body of the member 3 should such an operation be found necessary. Fixed to the forepart member 2 is a plate 22 the free end of which enters a recess 23 formed in the member 3 beneath the plate 20. The forward edge of the plate 20 will be faced off to avoid marking or pinching the insole. A hole 25 is provided in the plate 22 through which an insole securing tack may be driven.

The last embodying the present invention is peculiarly adapted for use in the manufacture of the so-called "force-lasted" shoes. Such shoes as pointed out in the above application have a flexible sock lining stitched at its margin to the upper and are lasted by forcing the last into the shoe. The last of this invention while in its closed position can be easily introduced into such a shoe and when thereafter expanded into its open position it will exert the lasting stress necessary to form the shoe. Similarly after the shoe is completed the last can be restored to its closed position and removed from the shoe. Other uses for this last include the manufacture of soft soled slippers, and the treeing or relasting operations performed upon certain types of footwear. The provision of the sockets 15 and 16 in the last facilitates its employment for such uses.

While two embodiments of this invention have been illustrated and described in detail it will be understood that the invention is not limited thereto and that other embodiments may be made without departing from the spirit and scope of the invention as set forth in the following claims.

I claim:

1. A last comprising a forepart member and a heel part member, which members are longitudinally separable, guiding means carried by one of said members and received in the other member, whereby the second member is guided for movement into contact with the first member to place the last in the closed position and from the first member to place the last in the opened posi-

tion, and latching mechanism by which the members are held a fixed distance apart when the last is in the opened position, said latching mechanism being mounted on said second member within the contour of the last and including an arm which projects from that surface of said member nearest the first member and is receivable in a recess in that surface of the first member nearest the second member when the last is in the closed position, which arm is actuatable to allow the complete removal of the second member from such guiding means.

2. A last comprising a forepart member and a heel part member, which members are longitudinally separable, parallel bars, one end of each bar being fixedly secured in one member and the other end of each bar being received in a bore in the other member, whereby the second member is guided for movement over said bars into contact with the first member to place the last in the closed position and from the first member to place the last in the opened position and latching mechanism mounted within a pocket in the second member and adapted to engage one of said bars to hold said second member a fixed distance from said first member when the last is in the opened position, said latching mechanism including actuating means located wholly within the contour of the last and actuatable to allow the complete removal of the second member from said bars.

3. A last comprising a forepart member and a heel part member, which members are longitudinally separable, parallel bars, one end of each bar being fixedly secured in one member and the other end of each bar being received in a bore in the other member, whereby the second member is guided for movement over said bars into contact with the first member to place the last in the closed position and from the first member to place the last in the opened position, and latching mechanism mounted within a pocket in the second member and adapted to engage one of said bars to hold said second member a fixed distance from said first member when the last is in the opened position, said latching mechanism including an arm which projects outwardly from said pocket and is easily accessible for actuation when the last is in the opened position to permit movement of the second member over said bars.

4. A last comprising a forepart member and a heel part member, which members are longitudinally separable, parallel bars, one end of each bar being fixedly secured in one member and the other end of said bar being received in a bore in the other member, whereby the second member is guided for movement over said bars into contact with the first member to place the last in the closed position and from the first member to place the last in the opened position, and latching mechanism mounted within a pocket in the second member and adapted to engage one of said bars to hold said second member a fixed distance from said first member when the last is in the opened position, said latching mechanism including an arm which projects outwardly from said pocket and is easily accessible for actuation when the last is in the opened position to permit movement of the second member over said bars in either direction.

5. A last comprising a forepart member and a heel part member, which members are longitudinally separable, parallel bars, one end of each bar being fixedly secured in the heel part mem-

ber and the other end of each bar being received in a bore in the forepart member whereby the forepart member is guided for movement over said bars into contact with the heel part member to place the last in the closed position and from the heel part member to place the last in the opened position, and latching mechanism mounted within a pocket in the forepart member and adapted to engage one of said bars to hold said forepart member a fixed distance from said heel part member when the last is in the opened position, said latching mechanism including actuating means located wholly within the contour of the last and actuatable to allow the complete removal of the forepart member from said bars.

6. A last comprising a forepart member and a heel part member, which members are longitudinally separable, parallel bars, one end of each bar being fixedly secured in the heel part member and the other end of each bar being received in a bore in the forepart member, whereby the forepart member is guided for movement over said bars into contact with the heel part member to place the last in the closed position and from the heel part member to place the last in the opened position, and latching mechanism mounted within a pocket in the forepart member and adapted to engage one of said bars to hold said forepart member a fixed distance from said heel part member when the last is in the opened position, said latching mechanism including actuating means located wholly within the contour of the last and actuatable to allow movement of the forepart member over said bars.

7. A last comprising a forepart member and a heel part member, which members are longitudinally separable, parallel bars, one end of each bar being fixedly secured in the heel part member and the other end of each bar being received in a bore in the forepart member, whereby the forepart member is guided for movement over said bars into contact with the heel part member to place the last in the closed position and from the heel part member to place the last in the opened position, and latching mechanism mounted within a pocket in the forepart member and adapted to engage one of said bars to hold said forepart member a fixed distance from said heel part member when the last is in the opened position, said latching mechanism including actuating means located wholly within the contour of the last and actuatable to allow movement of the forepart member over said bars in either direction.

8. A last comprising a forepart member and a heel part member, which members are longitudinally separable, parallel bars, one end of each bar being fixedly secured in the heel part member and the other end of each bar being received in bores in the forepart member, whereby the forepart member is guided for movement over said bars into contact with the heel part member to place the last in the closed position and from the heel part member to place the last in the opened position, and latching mechanism mounted within a pocket in the forepart member and adapted to engage one of said bars to hold said members a fixed distance apart when the last is in the opened position, said latching mechanism including actuating means located wholly within the contour of the last and actuatable to allow removal of the forepart member from said bars and replacement thereof by another forepart member.

9. A last comprising a forepart member and a

heel part member, which members are longitudinally separable, means whereby one member is guided for movement into contact with the other member to place the last in the closed position and for movement a fixed distance from the other member to place the last in the opened position, and means for closing the space between the members at the bottom of the last when the latter is in the opened position, said means comprising a plate fixed at one end to the bottom surface of the forepart member and bearing at its free end upon the bottom of the heel part member within a recess formed therein, and a plate fixed to the bottom of the heel part member over the recess formed therein.

10. A last for use in the manufacture of footwear, said last comprising a heel member and a forepart member, each of said members having a spindle-socket in its upper part, a pair of vertically spaced parallel guide rods having their axes in the plane of the axes of the sockets, each guide rod being fixed at one end in one of said last members and being free to slide in a bore in the other of said last members, the upper one of said guide rods having a single notch in that portion which slides in its respective bore, and a detent housed within the substance of that last member in which the upper guide rod slides, spring means urging the detent toward the upper guide rod for engagement with the notch in the latter, and an actuator for retracting the detent from the notch, the actuator being exposed between the opposed faces of the last members when the last is extended.

11. A last for use in the manufacture of footwear, said last comprising a heel member and a forepart member, each having therein a spindle-socket, rigid guide means fixed to and projecting from one of said last members and which is received with a sliding fit in the substance of the other last member, said guide means being of greater depth vertically than horizontally and being disposed in the plane of the axes of the spindle sockets, that last member in which the guide means slides having therein a bore in the plane of the spindle-socket axes, means closing the upper end of said bore, a detent housed within said bore, said detent being engageable with an element of the guide means to hold the last parts in extended position, spring means tending to project the detent into operative position, and an actuator, exposed between the last members, when the last is extended, operative to retract the detent thereby to permit contraction of the last.

12. In a last for use in the manufacture of footwear, said last comprising a heel member and a forepart member, the opposite faces of

5 said members being substantially flat and vertical, a pair of parallel, vertically spaced guide rods fixed at their rear ends in the heel member and having their forward parts arranged to slide in corresponding bores in the forepart member, the upper of said rods having a notch in its upper portion within its guide bore, the forepart member of the last having a detent-receiving bore whose axis is in the vertical plane of the axes of said guide rods and which intersects the bore which receives the upper guide rod, means closing the upper end of the detent-receiving bore, a detent within said detent-receiving bore, a spring housed wholly within the forepart member of the last and arranged to urge the detent downwardly, and an arm fixed to the detent and projecting out through an aperture in the vertical rear face of the forepart member of the last.

15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000 1005 1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 1065 1070 1075 1080 1085 1090 1095 1100 1105 1110 1115 1120 1125 1130 1135 1140 1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215 1220 1225 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3230 3235 3240 3245 3250 3255 3260 3265 3270 3275 3280 3285 3290 3295 3300 3305 3310 3315 3320 3325 3330 3335 3340 3345 3350 3355 3360 3365 3370 3375 3380 3385 3390 3395 3400 3405 3410 3415 3420 3425 3430 3435 3440 3445 3450 3455 3460 3465 3470 3475 3480 3485 3490 3495 3500 3505 3510 3515 3520 3525 3530 3535 3540 3545 3550 3555 3560 3565 3570 3575 3580 3585 3590 3595 3600 3605 3610 3615 3620 3625 3630 3635 3640 3645 3650 3655 3660 3665 3670 3675 3680 3685 3690 3695 3700 3705 3710 3715 3720 3725 3730 3735 3740 3745 3750 3755 3760 3765 3770 3775 3780 3785 3790 3795 3800 3805 3810 3815 3820 3825 3830 3835 3840 3845 3850 3855 3860 3865 3870 3875 3880 3885 3890 3895 3900 3905 3910 3915 3920 3925 3930 3935 3940 3945 3950 3955 3960 3965 3970 3975 3980 3985 3990 3995 4000 4005 4010 4015 4020 4025 4030 4035 4040 4045 4050 4055 4060 4065 4070 4075 4080 4085 4090 4095 4100 4105 4110 4115 4120 4125 4130 4135 4140 4145 4150 4155 4160 4165 4170 4175 4180 4185 4190 4195 4200 4205 4210 4215 4220 4225 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5230 5235 5240 5245 5250 5255 5260 5265 5270 5275 5280 5285 5290 5295 5300 5305 5310 5315 5320 5325 5330 5335 5340 5345 5350 5355 5360 5365 5370 5375 5380 5385 5390 5395 5400 5405 5410 5415 5420 5425 5430 5435 5440 5445 5450 5455 5460 5465 5470 5475 5480 5485 5490 5495 5500 5505 5510 5515 5520 5525 5530 5535 5540 5545 5550 5555 5560 5565 5570 5575 5580 5585 5590 5595 5600 5605 5610 5615 5620 5625 5630 5635 5640 5645 5650 5655 5660 5665 5670 5675 5680 5685 5690 5695 5700 5705 5710 5715 5720 5725 5730 5735 5740 5745 5750 5755 5760 5765 5770 5775 5780 5785 5790 5795 5800 5805 5810 5815 5820 5825 5830 5835 5840 5845 5850 5855 5860 5865 5870 5875 5880 5885 5890 5895 5900 5905 5910 5915 5920 5925 5930 5935 5940 5945 5950 5955 5960 5965 5970 5975 5980 5985 5990 5995 6000 6005 6010 6015 6020 6025 6030 6035 6040 6045 6050 6055 6060 6065 6070 6075 6080 6085 6090 6095 6100 6105 6110 6115 6120 6125 6130 6135 6140 6145 6150 6155 6160 6165 6170 6175 6180 6185 6190 6195 6200 6205 6210 6215 6220 6225 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