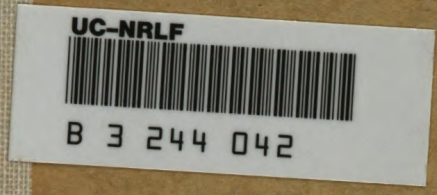
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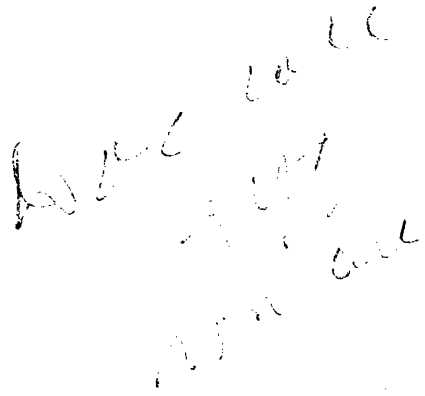
TECHNICAL MANUAL

INSPECTION OF SHOES

FEBRUARY 18, 1941

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TECHNICAL MANUAL

INSPECTION OF SHOES

CHANGES No. 1

WAR DEPARTMENT,
WASHINGTON, March 17, 1942.

TM 10-227, February 18, 1941, is changed as follows:

13. Fitting.—In the fitting room, sometimes called the stitching room, the cut parts of the uppers are fitted and stitched. The fitting thread used is **cotton of maximum strength, a lock stitch being used because of greater strength.** Practically all the operations in fitting * * * from the contracting depot.

[A. G. 062.11 (1-5-42).] (C 1, Mar. 17, 1942.)

16. Welting and making.—After the shoe has been bottom-lasted the welt strip is stitched around the sole of the shoe, **using a hot wax treated thread.** This strip is drawn very closely up * * * will be extra width on each side. The shoe then goes to the rough rounder who shapes the outside edges of the bottom so that the Goodyear stitcher may stitch the sole leather bottom units to the outside edge of the welting, **using a hot wax treated thread.** Following this operation, the shoe is heel seat nailed, bottom leveled, heeled, and heel trimmed, thus "making" the shoe.

[A. G. 062.11 (1-5-42).] (C 1, Mar. 17, 1942.)

18. General.

* * * * * * *

b. After award of contract for the manufacture of shoes is made by the procuring depot, it takes about 2 weeks for the manufacturer to get his supplies ready to begin upper leather cutting and sole leather preparation; then **a senior inspector** is selected to proceed to the factory. He will be assisted by upper leather and sole leather inspectors, and by **examiners** who will be sent to the factory in about 10 days. Shoes are generally bought f. o. b. place of manufacture. In the meantime the contractor forwards to the procuring depot samples of all materials such as he proposes to use in the manufacture of the shoes, and a pair of shoes showing what he proposes to deliver on the contract. **These are checked at regular intervals during the contract.**

* * * * * * *

[A. G. 062.11 (1-5-42).] (C 1, Mar. 17, 1942.)

19. Senior inspectors.—*a.* The **senior inspector** will report his arrival and the arrival of other inspectors at the factory, and also the actual date the contractor presents sole leather for inspection, and the date the contractor begins cutting the upper leather.

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b. The **senior inspector** also makes daily reports as to work accomplished by all inspectors in each department and a summation of these daily reports in weekly reports, showing progress on the contract.

* * * * * * *

d. It is also the duty of the **senior inspector** to see that each inspector, including himself, is properly supplied with the necessary specifications and stamps and that these stamps are properly taken care of and kept in the personal possession of the inspectors at all times.

[A. G. 062.11 (1-5-42).] (C 1, Mar. 17, 1942.)

20. Upper leather.—*a.* The first duty on arrival at a new contract is to inspect materials, both sole and upper leather. The upper leather inspector and the **senior inspector** should proceed to the contractor's upper leather stockroom and see that the upper leather corresponds to the requirements of the specification in every particular, especially as to the proper weight, pliability, firmness, and tightness of grain. If a colored leather * * * that the inspector is to handle every piece.

* * * * * * *

[A. G. 062.11 (1-5-42).] (C 1, Mar. 17, 1942.)

22. Shoemaking.—With the upper leather inspector taking care of the cutting and fitting for the daily production and the sole leather inspector working in much more detail on sole leather, the **senior inspector** must supervise all the operations between fitting and final inspection. On large contracts requiring a production of more than 3,000 pairs daily, or in factories where the workmen are not skilled, the **senior inspector** should have at least one man assigned to assist him in taking care of these departments. There are several important operations such as pulling, lasting, inseaming, inseam trimming, sole laying, rounding, and stitching which should be checked almost continually in order to insure the proper wear service of the shoes.

[A. G. 062.11 (1-5-42).] (C 1, Mar. 17, 1942.)

23. Final inspection.—*a.* The final inspection is usually done just after the shoes are cleaned and dressed and before they are packed, with the final inspectors and the **senior inspector** doing the best they can to see that full cases are packed without any empty cartons, and that the stencils accurately describe the contents of the shipping boxes. It is * * * covered by the heel pad.

* * * * * * *

[A. G. 062.11 (1-5-42).] (C 1, Mar. 17, 1942.)

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24. Shipping.

* * * * * * *

c. The **senior inspector** will see that all copies of the bill of lading give the number of boxes shipped, the number of pairs, the contractor's shipping numbers of the boxes, the actual gross weight, and the car and seal numbers. Forty-foot cars should be spotted for shipping, if possible.

[A. G. 062.11 (1–5–42).] (C 1, Mar. 17, 1942.)

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

U. S. GOVERNMENT PRINTING OFFICE: 1942

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TECHNICAL MANUAL
No. 10-227

WAR DEPARTMENT,
WASHINGTON, *February 18, 1941.*

INSPECTION OF SHOES

**Prepared under direction of
The Quartermaster General**

SECTION I. Types of shoes. Paragraph
General 1
Welt 2
Nailed 3
II. Lasts.
Munson last 4
III. Upper leather.
Types 5
Grain 6
Cutting 7
IV. Sole leather.
Hides 8
Soles 9
Heels 10
V. Manufacture.
Departments 11
Cutting 12
Fitting 13
Sole leather and stock fitting 14
Lasting 15
Welting and making 16
Finishing, treeing, and packing 17
VI. Inspection.
General 18
Inspectors-in-charge 19
Upper leather 20
Sole leather 21
Shoemaking 22
Final inspection 23
Shipping 24
VII. Fitting.
Measuring instruments 25
Grading 26
Fitting 27
Inside devices 28

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SECTION I

TYPES OF SHOES

Paragraph
General 1
Welt 2
Nailed 3

1. General.—Practically all military shoes are made by either the "welt" or "nailed" process. When these terms are used in describing shoes, they refer almost entirely to the method of fastening the bottoms to the uppers of the shoes. In all other respects the different types may be very much alike.

2. Welt.—The "welt" type of shoe is made by fastening the bottom of the shoe, consisting of one or two layers of sole leather, to the fitted upper by a strip of leather which is called welting and is ⅛ inch in thickness and $\frac{8}{16}$ inch in width. The inner edge of this welting fastens the upper and insole together by stitching with heavy thread, and the bottom of the shoe is fastened to the upper by stitching with heavy thread through the outer edge of the welting. The principal advantage of the welt shoe over the nailed shoe is that it has no nails coming through to the inside and it is more flexible. It is a little more costly to manufacture because of a greater number of operations and several items of extra material. All boots and shoes procured for Army use in peacetime are made by the welt process.

3. Nailed.—The "nailed" or metallic-fastened type of shoe is made by nailing the sole leather units straight through to the inner side of the insole. In commercial shoe manufacturing for civilian wear only the lowest priced shoes are made by this method, because the nailing makes the shoe stiffer on the bottom than the welt process and often causes roughness on the inside of the shoe when the clinch of the nails is too long. Military shoes are often made by this method, particularly in time of emergency, when it is necessary to insure better service with regard to the bottom staying on the shoe, and also when more than two layers of sole leather are used. In the latter case it is almost essential to use the nailed shoe, because a too heavy bottom on the welt shoe is likely to burst the inseam which fastens the bottom to the upper. The best made military shoes of the metallic-fastened type are made with one row of loose nails, a Goodyear stitched outer sole, and a reinforcement row of standard screws. While this type of shoe gives better assurance of the permanence of the bottom fastening, it adds nothing to the actual wear

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service of the sole leather, which is the weakest point of all military shoes. This weak point is strengthened only by adding hob nails, heel plates, and toe plates. For the manufacture of these metallic-fastened or nailed shoes, it is necessary to have lasts with iron bottoms so that the nails will be clinched on the inside of the shoe.

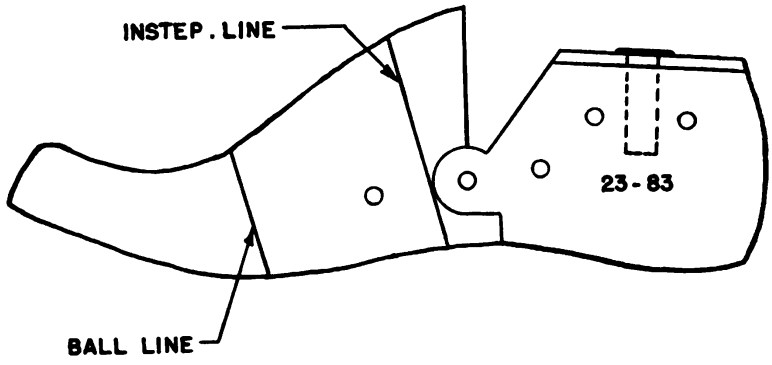


FIGURE 1.—Last.

SECTION II

LASTS

Paragraph
Munson last 4

4. Munson last.—Shoe lasts are necessary to shape the shoes properly, rights and lefts, and to determine the exact shape of the front of the shoes for style. Although all lasts for both men's and women's shoes are basically graded to the shape of the normal human foot they differ a great deal in the style, and there is no exact standard for either shape or size. This is the reason the Army has its own Munson last, so that whatever manufacturers have contracts for Army service or garrison shoes, the shoes will be of the same style, with the same shape toe in every pair, and the same exact grading between sizes and widths. This grading is very important and amounts to $\frac{1}{3}$ inch between whole sizes and $\frac{1}{6}$ inch between half sizes. There is another important modification of this in the widths, which means an additional $\frac{1}{4}$ inch between whole sizes and $\frac{1}{8}$ inch between half sizes. The bottoms of the lasts also grade $\frac{1}{16}$ inch between widths A, B, C, D, E, and EE. Shoe lasts must be made of selected, fine grade wood, such as, maple grown on hills or at least away from low land where moisture and water are likely to gather.

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SECTION III

UPPER LEATHER

	Paragraph
Types	5
Grain	6
Cutting	7

5. Types.—Army garrison shoes, nurses' shoes, and flying cadets' shoes are made from calf leather. Service shoes and leather boots for mounted enlisted men are made from side leather. Side leather, similar to that used in the Regular Army service shoe, is also used in practically the same type of shoe during an emergency. Side leather is made from cow or steer hides taken from animals which are more than 2 or 3 years of age. Consequently, these hides are large and the leather, when finished, will measure as much as 50 square feet in area. This large hide is cut straight up the middle for easy handling in the tannery and in the factory. The side leather taken from older animals is much coarser when the hair is removed from it than is the calf leather, the skins for which are taken from calves sometimes as young as 2 weeks. Consequently the grain in calf leather is much finer than in the cow or steer hides.

6. Grain.—The grain of most calfskins is left intact and the skins are finished by a basic dyeing and then finishing with a good grade of pigment coloring. In side leather the grain is so rough and so uneven that it is generally necessary to buff it, that is, to take a very slight shaving (about $\frac{1}{60}$ inch in thickness) off the surface. Because of this buffing, and the coarse surface, it is necessary to finish side leather with a heavier pigment coverage. In using more pigment, the leather will not be so fine and pleasing to the eye as the calf leather; but it looks much better than it would if it were finished full grain without the buffing. For these reasons, the side leather costs considerably less per square foot than does the calfskin.

7. Cutting.—Side leather comes in pieces from 18 to 24 square feet in area, and it takes approximately 4 square feet to cut one pair of Army service shoes. Practically all the area of the side can be utilized in cutting the service shoe, with care being taken to cut the vamps and toe caps from that part of the side nearest the backbone where it is firmer and not likely to stretch. This is important in an unlined shoe. The poorer parts of the side, such as the flanks and pockets where the leather is loose and pipey, are cut into the tongues of the shoes. The better parts of the flanks may be cut into the quarters.

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SECTION IV

SOLE LEATHER

	Paragraph
Hides	8
Soles	9
Heels	10

8. Hides.—Sole leather is made from the same types of hides as the upper leather except that there is a greater proportion of steer hides in sole leather because steer hides are the heaviest. A very important difference between upper leather and sole leather is in the thickness of the leather. This difference is brought about by the difference in tannage. Although both leathers are tanned at their full thickness, the sole leather is deliberately pumped up to a greater thickness and then "filled" and rolled down hard and solid, in which condition it is often three times as thick as is the heaviest side upper leather. The heaviest upper leathers often have to be split to decrease their thickness but sole leather is seldom split because thickness means very much in its selling value. The thickest sole leather is obtained from the oldest animals which have the thickest hides. The grain appearance of sole leather does not affect its selling value as it does in upper leather.

9. Soles.—The hides and sides of sole leather are about the same size and area as those of upper leather and, similarly, the different parts of the tanned hides differ in value because of the fineness of the fiber. The fine, closely packed fiber which is found nearest the backbone and the butt and along this area toward the shoulder, is of greater value for sole leather, and that part of the hide near the flank and in the pockets is of lesser value because the fiber is not packed so closely and, therefore, will not resist wear as well as finely packed fiber. However, there is some use for all parts of the sole leather, side or back. Outer soles meeting Army specifications must be cut from that portion of the side containing the finest fiber, the middle soles may be cut from the best part of the shoulder where the fiber is not quite so fine, and the inner soles may be cut from the bellies, shoulders, and flanks where the fiber is looser. These parts best serve the purpose for making insoles, which do not have to resist abrasive wear as do the outer soles. Sole leather counters and bottom fillers are in about the same fiber class as the insoles.

10. Heels.—The heel lifts are of different wear value in accordance with their fiber. The top lift and under lift must have as

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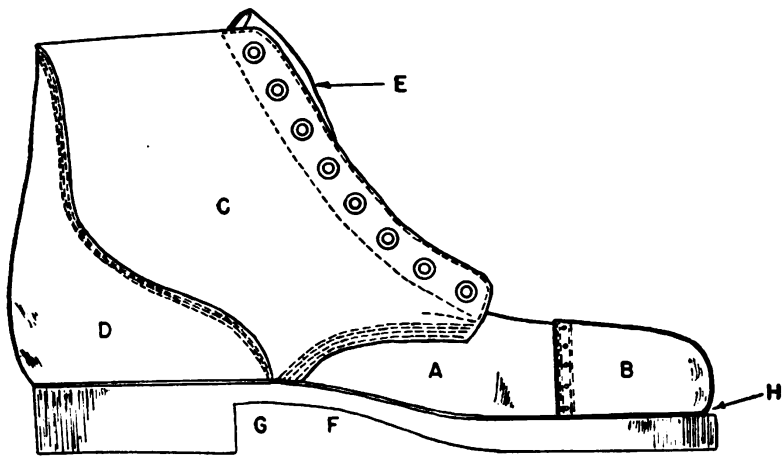
good a wear value as the outer sole. The heel lifts may be second shoulder cuts or picked up in any part of the side or back where the fiber is good enough for heel lifting.

SECTION V

MANUFACTURE

	Paragraph
Departments	11
Cutting	12
Fitting	13
Sole leather and stock fitting	14
Lasting	15
Welting and making	16
Finishing, treeing, and packing	17

11. Departments.—The shoe used by the Army for emergency purposes is similar to the peacetime Army service shoe, except that the bottom of the emergency shoe will be nailed instead of being welted. The manufacture of either type of shoe is done in 6 principal departments—cutting, fitting, lasting, sole leather, making, and finishing. It takes from 6 to 9 days to manufacture service shoes, depending upon the equipment and efficiency of the factory making the shoes. In the manufacture of the Army service shoe, which has no lining, there are approximately 130 separate operations and the majority of these operations require skilled workmanship. The



A. Vamp.
B. Tip.
C. Quarter.
D. Counter pocket.
E. Tongue.
F. Shank.
G. Heel breast.
H. Edge extension.

FIGURE 2.—Service shoe.

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upper leather and sole leather are started together from different parts of the factory and by the time the uppers are cut, fitted, and lasted, the sole leather has been made ready for attaching in the making department. From there the shoes proceed to the finishing department and then to the shipping room.

12. Cutting.—The service shoe upper has six different leather parts which, in the order of their importance are vamp, tip, quarter, counterpocket, tongue, and eyelet stay. These parts are cut by a machine with steel dies. Each operator cuts about 120 pairs in an 8-hour day. The shoes are stacked in 24-pair lots and go through the factory in this way. In some factories they are divided into 12-pair lots and go through a little faster. This quantity of 120 pairs for cutting is called a "job" and requires about 470 square feet of upper leather, valued at about $100.00. The experienced cutter knows that he must lay his various dies on the right parts of the side and at the proper angles in order to get the necessary quality and stretch in each of the parts, and also to use up every inch of the leather, if possible, since this leather in normal times is valued at about 21 cents per square foot. Such small scraps as remain when the cutter finishes his job are used in cutting the small eyelet stays. This is an unskilled operation, performed with a small hand die and a mallet.

13. Fitting.—In the fitting room, sometimes called the stitching room, the cut parts of the uppers are fitted and stitched. The fitting thread used is generally linen because of its greater strength, and the lock-stitch is used for the same reason. Practically all the operations in fitting the shoe require skill, as in the vamping, counterpocket stitching, and tip stitching, but the Army service shoe is not a difficult shoe to fit and stitch and, therefore, there is but little trouble originating in this room. This, of course, is partly due to the fact that the contracts for the manufacture of Army shoes always specify the assignment to the factories of inspectors from the contracting depot.

14. Sole leather and stock fitting.—While the shoes are being cut and fitted, the sole leather parts, which include the counter and insole, are being prepared so that when the shoes are ready for lasting the sole leather parts in the right sizes and widths will be prepared and assembled. Sometimes the counters are bought by the contractor in a fitted condition. Other times the contractor cuts his own counters and skives and sands them smoothly along the edges. The insoles must be rounded to the proper size and width, channeled, cemented, and "gemmed" with heavy canvas to strengthen

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the lip of the inner sole to which the welt and upper are stitched. The sole leather parts, particularly the outsole and insole, are important enough, with regard to the wear-service of the shoe, and also the figured cost of the shoe, to necessitate their inspection, separately, before they are placed in or attached to the shoe. The accepted outer and inner soles are stamped with the Government inspector's number to avoid their being confused with sole leather intended for use in the contractor's commercial line. The difference in thickness of outer soles, amounting to only 1 iron ($\frac{1}{48}$ inch), sometimes makes a difference of from 3 to 5 cents in the cost of a pair of outer soles, which is sufficient reason for their separate inspection.

15. Lasting.—When the uppers are fitted they are sent to the lasting room. Insoles of the proper width and size are then tacked to the corresponding last for each 24-pair lot, or 12-pair lot, of the shoes which have been fitted. The counters have been mulled and dried to the proper temperature, and the shoe goes to the assembler who places a counter in the counterpocket and tacks the shoe upon the last by driving one tack at the heel. The shoe then goes to the very important and skillful operation of "pulling." This operation is performed by a machine which drives 7 tacks in one operation, with the shoe centered exactly right on the last so that the further operations of side lasting and bottom lasting will shape the shoe correctly and snugly to the last, insuring a properly fitting shoe. The shoes then go to the making room.

16. Welting and making.—After the shoe has been bottom-lasted the welt strip is stitched around the sole of the shoe. This strip is drawn very closely up to the lip of the insole which insures the proper shape of the bottom of the shoe. The excess upper leather is then trimmed off, the welt flattened out, and the bottom filled with sole leather $\frac{1}{8}$ inch thick, thus presenting a flat surface for the laying of the middle sole and the outer sole. These two soles are carefully laid on the flattened out welt and bottom filler so that there will be extra width on each side. The shoe then goes to the rough rounder who shapes the outside edges of the bottom so that the Goodyear stitcher may stitch the sole leather bottom units to the outside edge of the welting. Following this operation, the shoe is heel seat nailed, bottom leveled, heeled, and heel trimmed, thus "making" the shoe.

17. Finishing, treeing, and packing.—Although departmental line-ups vary in different factories in accordance with the grade and type of shoe being made, the finishing operations start with the heel scouring and proceed through the edge trimming, edge setting, and

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heel finishing, to the treeing room, where the shoe is cleaned and dressed ready for packing. In or just before the shoe reaches the packing room, all Army shoes are carefully searched for insole tacks. The shoes are packed with great care to see that they are properly mated as to size and width and that the shipping cases contain the number of pairs which are stenciled on the outside of the case, thus preventing shortages being reported when the case may be opened weeks or months afterwards. Practically all Army shoes and boots are inspected by Government inspectors in the contractor's packing room just before the contractor's employees pack the shoes for shipment. This undoubtedly prevents many errors in packing and shipping besides insuring that the contractor's delivery complies with the specification requirements.

SECTION VI

INSPECTION

	Paragraph
General	18
Inspectors-in-charge	19
Upper leather	20
Sole leather	21
Shoemaking	22
Final inspection	23
Shipping	24

18. General.—*a.* Like other trades the skilled workers in shoe manufacturing are highly specialized. A skilled operator may perform one operation for 15 or 20 years and yet know very little about another. This specialization must be carefully considered when appointing shoe and leather inspectors so that the inspection force may be properly balanced. In the selection of inspectors, experience is only half the necessary requirement for a good inspector. Character and temperament are very important as are also age and physical condition. The final selection of inspectors should be through a careful oral examination at the procuring depot. In case of emergency where rapid expansion of the inspection force is necessary, it is probable that most of the applicants will be selected by personal interviews at the procuring depot, followed by noncompetitive examinations Schools will be established for training the selected applicants before they are assigned to any inspection work.

b. After award of contract for the manufacture of shoes is made by the procuring depot, it takes about 2 weeks for the manufacturer to get his supplies ready to begin upper leather cutting and sole

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leather preparation; then an inspector-in-charge is selected to proceed to the factory. He will be assisted by upper leather and sole leather inspectors, and by final inspectors who will be sent to the factory in about 10 days. Shoes are generally bought f. o. b. place of manufacture. In the meantime the contractor forwards to the procuring depot samples of all materials such as he proposes to use in the manufacture of the shoes, and a pair of shoes showing what he proposes to deliver on the contract.

c. One upper leather inspector is deemed sufficient for production up to 5,000 pairs daily, but the assignment of sole leather inspectors should be based upon a productive capacity of 800 pairs daily for each man assigned, that is, for 5,000 pairs daily there would be 7 sole leather inspectors. The assignment of final inspectors is based upon a daily productive capacity of 700 pairs for each man. Various sole leather parts and the finished shoes must be stamped by the inspector who accepts them.

19. Inspectors-in-charge.—*a.* The inspector-in-charge will report his arrival and the arrival of other inspectors at the factory, and also the actual date the contractor presents sole leather for inspection, and the date the contractor begins cutting the upper leather.

b. The inspector-in-charge also makes daily reports as to work accomplished by all inspectors in each department and a summation of these daily reports in weekly reports, showing progress on the contract.

c. He will make at least four inspection trips through each department of the factory each day to check up on his assistant inspectors and to supervise the work of the contractor's employees in the lasting, making, finishing, treeing, and packing rooms.

d. It is also the duty of the inspector-in-charge to see that each inspector, including himself, is properly supplied with the necessary specifications and stamps and that these stamps are properly taken care of and kept in the personal possession of the inspectors at all times.

20. Upper leather.—*a.* The first duty on arrival at a new contract is to inspect materials, both sole and upper leather. The upper leather inspector and the inspector-in-charge should proceed to the contractor's upper leather stock room and see that the upper leather corresponds to the requirements of the specification in every particular, especially as to the proper weight, pliability, firmness, and tightness of grain. If a colored leather is to be used, it should be a good match for the standard sample swatch furnished by the procuring depot. The cut "jobs" are then put up and distributed to the cutters and the inspector keeps a continual check-up on the shoes that are

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being cut, or have been cut, to see that all shoes cut are delivered to the Government up to specification requirements. This does not mean that the inspector is to handle every piece.

b. Should a contractor proceed with the cutting of upper leather which does not correspond to specification requirements, the inspector should advise him not to cut such upper leather and immediately inform the commanding officer of the procuring depot. Experience has shown that most trouble with upper leather is had from stiff hard tannages, stretchy vamps, and loose and pipey grain. In an unlined shoe it is important that the vamps are cut, toed, and winged toward the backbone. This gives a firm vamp with the most firmness across the toes. The upper leather inspector takes care of skiving, crimping, and tongue splitting, and also makes regular trips to the fitting room to check on the fitting operations.

21. Sole leather.—*a.* The weak feature of any military shoe is its sole leather. Factory inspection on contracts insures a very serviceable shoe in all respects but even the best of sole leather wears out too soon in a military shoe, particularly in an emergency. This is due to the greater activity of the wearers and also to the shoes becoming wet more often than civilian shoes, and, in many instances, to drying wet shoes by placing the shoes against hot stove railings or on hot steam pipes. The common practice is to hob-nail the sole part and to put metal heel plates and toeplates on military shoes. This probably reduces the physical efficiency of the wearers but adds to the wear of the shoe bottom.

b. Inspection of all sole leather, with the stamping of the outsoles, insoles, middle soles, and counters which are accepted, is important for the reason that when these items are assembled in the manufactured shoe it is impossible to tell the grade and thickness of an outer sole or middle sole, and but little more can be told about the inner sole. When sole leather prices are high, there is probably a difference of about 5 cents per pair between the 9-iron outer soles and the 8-iron outer soles, this difference being only $\frac{1}{48}$ inch. A further difference of 5 cents per pair could be made in a lower grade than that which is specified, this difference being impossible to tell after the edge is finished on the shoe.

c. As has been stated, all Army outer soles must be of strictly fine grade as to the fiber, but much greater grain defects will be accepted in an Army shoe than could be sold on a commercial dress shoe. The Army does not sell shoes in competition and this enables the selection of better wearing soles without so much consideration for appearance, thus increasing the supply and modifying the price. Middle

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soles must be very nearly as good as outsoles. Inner soles are of an entirely different fiber selection since they do not have to resist the abrasive wear of the outsoles and middle soles. Therefore, they may be cut from the loose fiber parts of the hide which would not be at all suitable for the leather units which require abrasive wear service. On the other hand, if an insole is cut from the backbone part of the hide where the fiber is close it will not be suitable for an insole. This close fiber tears much more easily than the slightly looser fiber thus causing broken inseams.

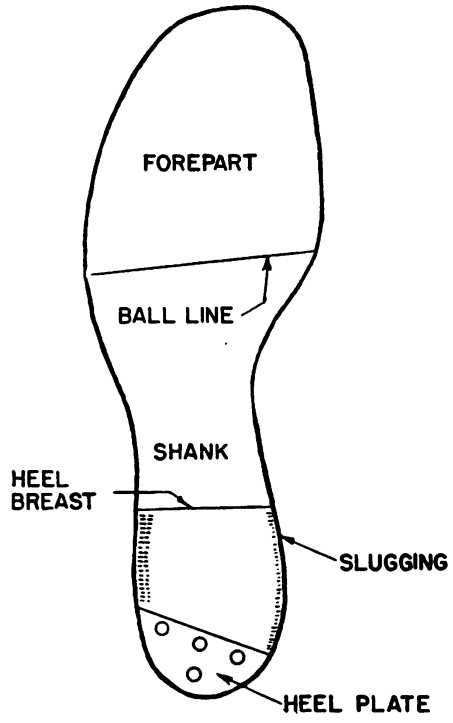
d. It is more economical to hire unskilled laborers to do the stamping. After becoming familiar with the work, each of these stampers should stamp the sole leather units up to a production of 1,500 pairs daily.

e. The sole leather inspector is responsible for the proper care and use of his stamp, and should keep it within his custody or within his sight at all times.

22. Shoemaking.—With the upper leather inspector taking care of the cutting and fitting for the daily production and the sole-leather inspector working in much more detail on sole leather, the inspector-in-charge must supervise all the operations between fitting and final inspection. On large contracts requiring a production of more than 3,000 pairs daily, or in factories where the workmen are not skilled, the inspector-in-charge should have at least one man assigned to assist him in taking care of these departments. There are several important operations such as pulling, lasting, inseaming, inseam trimming, sole laying, rounding, and stitching which should be checked almost continually in order to insure the proper wear service of the shoes.

23. Final inspection.—*a.* The final inspection is usually done just after the shoes are cleaned and dressed and before they are packed, with the final inspectors and the inspector-in-charge doing the best they can to see that full cases are packed without any empty cartons, and that the stencils accurately describe the contents of the shipping boxes. It is the contractor's obligation to present to the final inspectors only such shoes as correspond to specification requirements in all respects as to material, workmanship, and finish, including a careful inspection of the inside of the shoe for the presence of nails or insole tacks. The contractor's employees who insert the heel pads should see that the heel seat is free from loose or rough nails before it is covered by the heel pad.

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Edge extension	3/16 inch at toe and inside edge. 1/16 inch at outside ball.
Welt	6 irons, 6/48 inch.
Middle sole	7 irons, 7/48 inch.
Outer sole	9 irons, 9/48 inch.

FIGURE 3.—Shoe bottom.

b. Some shoe factories make shoes in 24-pair lots, others in 12-pair lots, and the first point for checking when the inspector pulls a rack of shoes to his bench is the number of pairs and the size and width to see that it corresponds with the factory ticket on the rack. He should then count the shoes to see that the full number of pairs of shoes as called for is on the rack. While doing this he scans the shoes for any evidence of poor workmanship such as cleaning, treeing, or dressing. This is done without picking up any shoes and often results in sending a case back for further work to be done on the shoes. If the case looks all right, while the inspector is counting the shoes, he places 6 or 12 pairs on his bench and proceeds with the inspection,

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pair by pair. The inspector often sees a defect before he begins his pair-by-pair inspection. He then enters the number of the case and the number of pairs in sizes and widths on his daily work sheet. He then proceeds by opening the quarters at the ears to check the condition at the throat, meanwhile observing the quality of the tongue and the clinch of the eyelets. Then he picks up a pair of the shoes observing the quality of the upper leather, the edge extension, Goodyear stitching, and eyelets, while he is turning the shoes over to observe the bottom and the size and width stamp in the shank of the outsole. This is to prevent an occasional shoe of the wrong size and width being packed. The inspector then places the pair back on

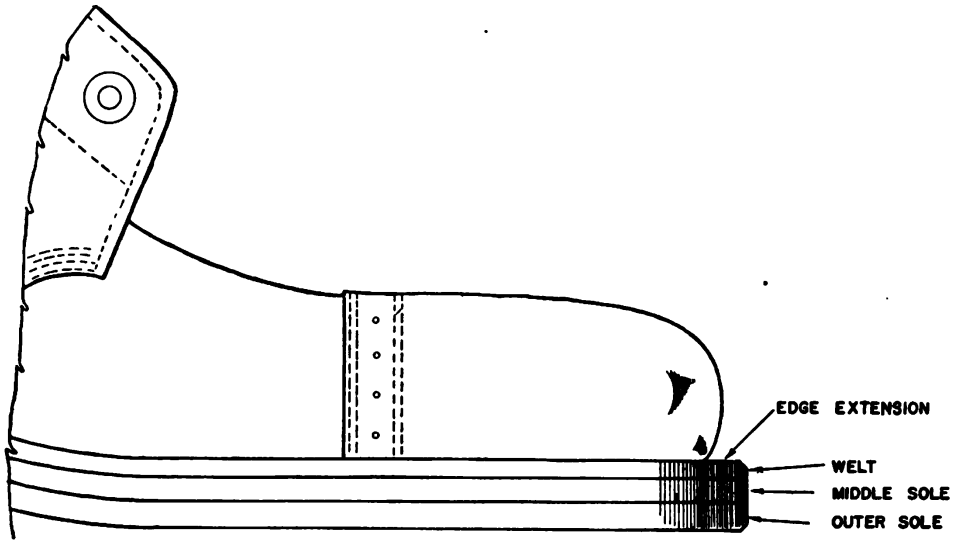


FIGURE 4.—Detail of bottom.

his bench and proceeds with the single-shoe inspection by picking up one shoe and inserting his hand inside it to inspect it for tacks, nails, and the condition of the insole and heel seat. At the same time he observes further details of the outside of the shoe, such as the upper leather quarters and inseam. He then places the single shoe back on the bench and goes through the same inspection with its mate, thus proceeding through the whole case.

c. A pair of shoes may be inspected in 30 seconds. However, a good day's work for final inspection is 600 to 700 pairs, depending upon the efficiency of the contractor and his employees. Poor shoemaking and poor workmanship in the various departments of the shoe factory have a definite effect in modifying the daily production on final inspection.

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24. Shipping.—*a.* After carefully checking the stenciling of the cases and loading of the cars as to total quantities, sizes, and widths, the inspector will sign the contractor's invoice which is forwarded to the disbursing officer in the zone of the procuring depot.

b. The bills of lading are generally furnished by the procuring depot and consist of five sheets, one white sheet which is the original, three yellow memorandum sheets, one of which is marked "Property receiving copy," and one salmon colored sheet, called the shipping order, which is kept by the carrier's agent who will date and sign all the other copies of the bill of lading. The original copy and the property receiving copy are forwarded to the consignee; one copy is sent to the contracting depot; and the last copy is given to the contractor.

c. The inspector-in-charge will see that all copies of the bill of lading give the number of boxes shipped, the number of pairs, the contractor's shipping numbers of the boxes, the actual gross weight, and the car and seal numbers. Forty-foot cars should be spotted for shipping, if possible.

SECTION VII

FITTING

	Paragraph
Measuring instruments	25
Grading	26
Fitting	27
Inside devices	28

25. Measuring instruments.—Footwear is the item of clothing which is most necessary to fit properly. The best fitting of shoes is accomplished by trained clerks in commercial retail shoe stores which sell the better grades of shoes. In such stores a simple size stick is used to get the length of the foot for try-on of the first pair of shoes. But the experienced clerk may often make a very good estimate of the size and width worn by a prospective buyer when he sees him entering the store by a quick glance at his shoes and by observing his height and weight. This expert opinion is developed only through constant practice of fitting shoes during a period of years. Besides the size stick and the Army Resco Foot Measuring Machine, there is only one other such instrument, and all these instruments are efficient only when used by persons who have had some experience in fitting shoes. At best they can be used only to establish the size and width of the try-on pair.

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26. Grading.—More rapid progress will be made in the proper fitting of shoes when the fitters learn and realize the grading between sizes and widths, as described in paragraph 13. The grading of the lasts determines the grading of the shoes which are made upon the lasts. The sample size of Army shoes, patterns, and lasts is 8-D. The length of the foot of a man who wears this size of Army shoe on the inside is 10 and $^{15}/_{16}$ inches. Up and down from this size 8-D there is a grade in length of $^{1}/_{3}$ inch between whole sizes and $^{1}/_{6}$ inch between half sizes. Also, on any definite size length there is a grade in width of $^{1}/_{4}$ inch between widths. This grade between widths means the difference in the circumferential measurement of the foot, or the shoe (inside), at its widest part, that is, between the centers of the large joints of the large toe and small toe. There is also a grade difference of $^{1}/_{12}$ inch in the width of the last bottom between widths. An understanding of this grading in sizes and widths will result in better fitting of shoes.

27. Fitting.—*a.* Men at any Army post, camp, or station cannot be properly fitted with shoes unless there is a sufficient range of sizes and widths in stock either at the camp or post or at the nearest storage depot. Most men do not know the size and width of the shoes they are wearing so that, in the case of recruits, it is well to examine the quarter lining inside the shoe for its size marking, which if decipherable and understandable leads to the selection of the try-on pair of Army shoes. There is no standard method of marking sizes and widths on commercial shoes, but the widths are generally represented as 1, 2, 3, 4, 5, and 6. Army shoes are marked from A to EE. The commercial shoes are marked for size length from 6 to 12 and the half sizes generally are represented by the figure 5. That is, an Army shoe plainly marked 7½-E would, in commercial shoe manufacturing be marked 575. In determining the size and width marking of a commercial shoe, care must be taken to eliminate other figure markings on the quarter lining, such as factory case numbers and stock numbers referring to style.

b. When the try-on pair of shoes is laced on the man's foot the accuracy of fit for width is not difficult to note, either by sight or by feeling across the ball line, the widest part of the foot, with the fingers to determine tension or slackness of the leather at that point. But the proper size length can be accurately determined only by the man who has the shoe on his foot. The fitter might grasp the toe and heel of the shoe, and work it back and forth to determine heel slip which generally indicates a shoe of too long a size. There must be two-thirds of an inch space inside the shoe ahead of the wearer's

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toes when he is standing with a loaded pack. The accuracy of the size length may be observed by noting whether the center of the large joint of the man's large toe appears to come exactly at the place intended for it in the shoe. That place is called the inside ball and is exactly over the point where the bottom edge of the shoe begins to swing sharply inward toward the heel.

28. Inside devices.—AR 850–125 is clear and definite as to the proper fitting of shoes. The Army Resco Foot Measuring Outfit has inside devices to test the proper length of the shoe, at least insuring that the shoe will not be too short. The inside devices of the proper size and half size are placed in the try-on pair of shoes and if a man can walk about with comfort, with these devices in the shoe, he is assured of a shoe that is long enough. But these devices offer no check-up against shoes which are too long.

[A. G. 062.11 (11–4–40).]

BY ORDER OF THE SECRETARY OF WAR:

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OFFICIAL:

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Major General,
The Adjutant General.

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