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MARKING SYSTEMS FOR SPECIAL CLOTHING AND EQUIPMENT

by

Frank A. Bonanno

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A white cotton label was recommended for attachment to black combat boots and black belt webbing during manufacture for later marking with black ink. White or colored inks previously considered for direct application to these items are unsatisfactory, although caps (garrison, service and field), helmet liner headbands, oxford dress shoes and duffel bags can be marked satisfactorily by direct application of black ink.

Various commercial marking systems are described, analyzed and discussed. These include pads and inks (for hand lettering), rubber stamps, hand printers, stencils, brushes, pens and markers, both fiber and felt.

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Clothing And Personal Life Support Equipment Laboratory
US ARMY NATICK LABORATORIES
Natick, Massachusetts

FOREWORD

At the request of the Adjutant General's Office (AGO), Department of the Army, a study was conducted to evaluate methods for marking a soldier's name and social security number on selected items of individual clothing and equipment. Since standard marking devices and inks did not exist, establishment of a uniform system was required to eliminate the variable results being obtained with non-prescribed methods. Such a system would improve means of personnel identification, particularly casualties, and it would also be an aid to property accountability.

As a result of the study, a procedure has been recommended whereby durable and legible marking of various items of clothing and equipment may be consistantly obtained. The need for a standardized stamping kit, including pad and ink as well as a training manual for marking clothing items is indicated.

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ABSTRACT

A study was made to develop an ink marking system for selected items of individual military clothing and equipment to provide legible, durable and uniform results on dissimilar surfaces of such materials as leather, fabric and webbing.

A white cotton label was recommended for attachment to black combat boots and black belt webbing during manufacture for later marking with black ink. White or colored inks previously considered for direct application to these items are unsatisfactory, although caps (garrison, service and field), helmet liner headbands, oxford dress shoes and duffel bags can be marked satisfactorily by direct application of black ink.

Various commercial marking systems are described, analyzed and discussed. These include pads and inks (for hand lettering), rubber stamps, hand printers, stencils, brushes, pens and markers, both fiber and felt.

MARKING SYSTEMS FOR SPECIAL CLOTHING AND EQUIPMENT

1. Introduction

Various methods for marking of individual items of military clothing have been used by U.S. Army personnel for many years. While the items were required to be marked, no specific method had been prescribed which often resulted in illegible, non-durable impressions. The U.S. Army Natick Laboratories were requested by the Office of the Adjutant General (AGO) to develop a standard marking system for ink marking of the individual's name and social security number on selected clothing. (1)

The scope of this study included the evaluation of various commercial marking devices and inks, as well as inks from the Defense Supply System, and alternate methods of marking where direct ink impressions on an item surface were inadequate. The purpose was to develop an ink marking system suitable for obtaining good legibility, uniformity, and durability on dissimilar materials and surfaces such as leather, fabric and webbing.

2. Discussion

Army Regulation AR-746-10, "Marking of Selected Clothing and Equipment," requires that the individual's full name and social security number be applied at prescribed locations with indelible and water-resistant ink on a select group of clothing items and equipment such as the duffel bag. (2) The lettering is limited in size by the regulation, depending on amount of area to be marked. Dark-colored items are to be marked with white ink and light-colored items with black ink. The items include footwear (boots and shoes), headgear (field, service and garrison caps), headbands for helmet liners, belts, and duffel bags. Although AR-746-10 provides instructions for identification marking, and suggests general methods for marking, i.e., stencil, pen, rubber or metal stamps, and also specifies black ink on light-colored items and white ink on dark-colored items, there are no specifics regarding the marking devices or inks. For example, "the most efficient method of marking a duffel bag is to use an oil-treated paperboard stencil made by a stencil cutting machine, which is held against the bag and hand-brushed with a suitable ink." To develop an adequate marking system that would comply with AR-746-10, the following guidelines were established:

a. Marking shall be easily applied to the item.
b. Marking shall be legible, uniform and clean.
c. Marking shall be indelible and water-resistant.

3. Types of Marking Systems

Marking systems which were either evaluated or considered for marking of individual clothing were divided into two general categories: penmanship type (Figure 1) and fixed print lettering (Figure 2). The penmanship type includes ball-point varieties, drawing pen, brush, indelible pencil, crayon pencil, nylon point pen, and felt tip markers. The fixed lettering marking devices include

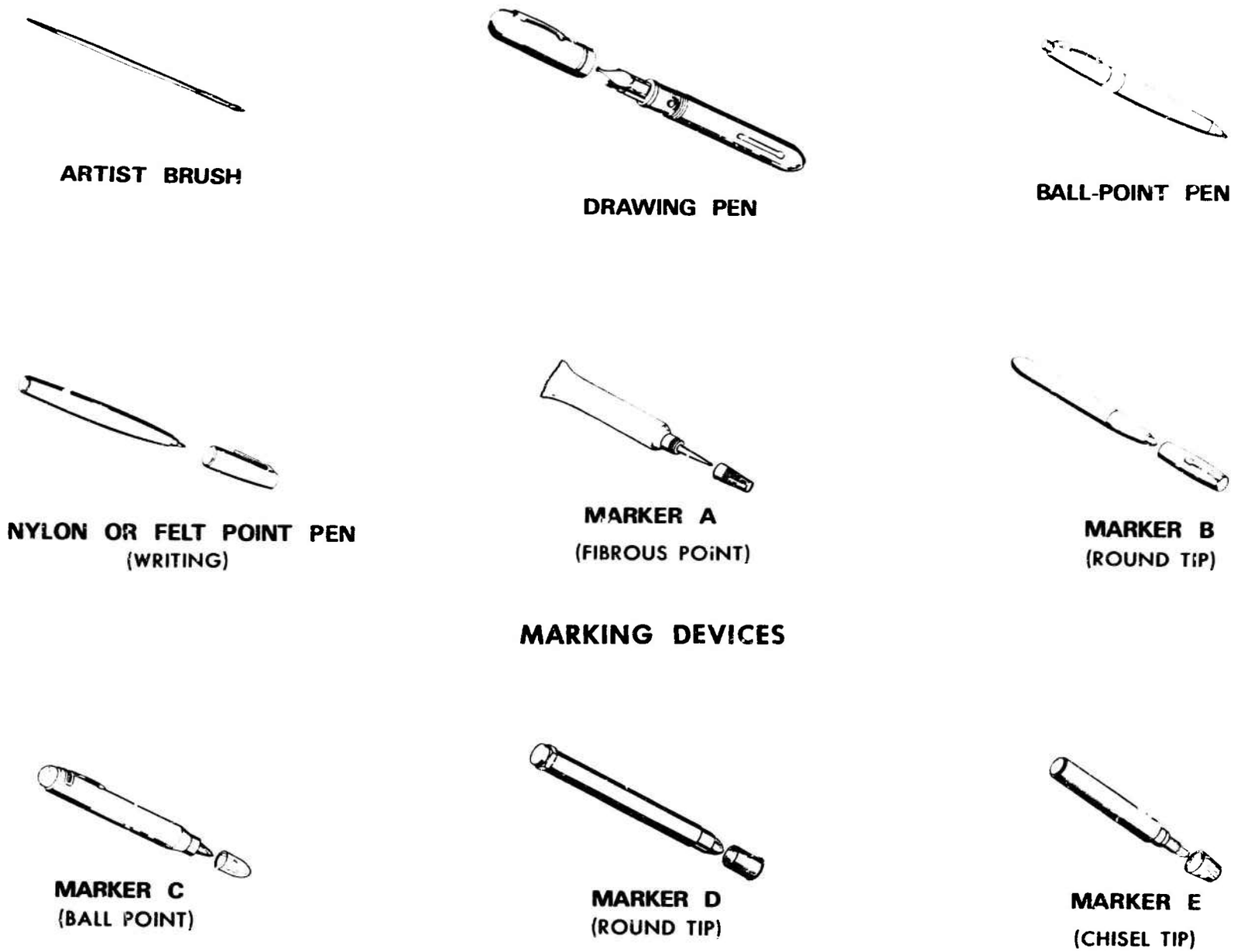

Figure 1. Penmanship type of marking system for marking of individual clothing and equipment

rubber stamps and stencils. The following describes and comments on these marking systems:

a. Penmanship-type marking devices

(1) Ball-point pen varieties (produces degrees of legibility requires special inks).
(2) A drawing pen with fountain.
(3) An artist's brush requires time, patience and some skill.
(4) An indelible pencil does not always produce neat and clean impressions.
(5) A crayon pencil is unsatisfactory.
(6) A nylon point and a felt point pen are as good as the quality of the inks with which they are used.
A number of proprietary markers were evaluated. These include:

Marker A - Reservoir of ink with fibrous writing point (black and white)

Marker B - Reservoir of ink with felt point

Marker C - Reservoir of ink with ball point (black, white and yellow)

Marker D - Reservoir of ink with round felt tip

Marker E - Reservoir of ink with chisel tip

b. Fixed-print lettering (see Figure 2)

(1) Rubber stamp (with and without handle). This stamp consists of two lines, 3/16 or 1/4-inch high Gothic style lettering (made to order)
(2) Rubber pocket stamp. Made in 3/16-inch high lines in Gothic style lettering, it includes ink and pad. It is also made to order.
(3) Rubber stamp set. This set is made in two lines, with lettering 1/4-inch high in Gothic style print.
(4) Rubber stamp (two handle) for duffel bag. A one-line device, it has lettering in 1 1/2-inch Gothic style print. It is not practical for use in Army training centers because its use is time-consuming.
(5) Stencil (handprinter). The stencil is prepared on a typewriter or by using a ball point pen. It can be used a number of times and then discarded. The stencil was considered for Army unit use only.
(6) Stencil (brass). This type of stencil is adjustable and interlocking. The lettering is 1 1/2-inches high and ink is applied with a brush. While it is appropriate for marking individual duffel bags, it is not a practical device for large-scale use.
(7) Stencil machine. The stencil machine cuts out letters and numbers one to two inches high in oil-treated paperboard and is currently available in training centers (not shown in Figure 2). The stencils are used to mark items with a brush and stenciling ink.

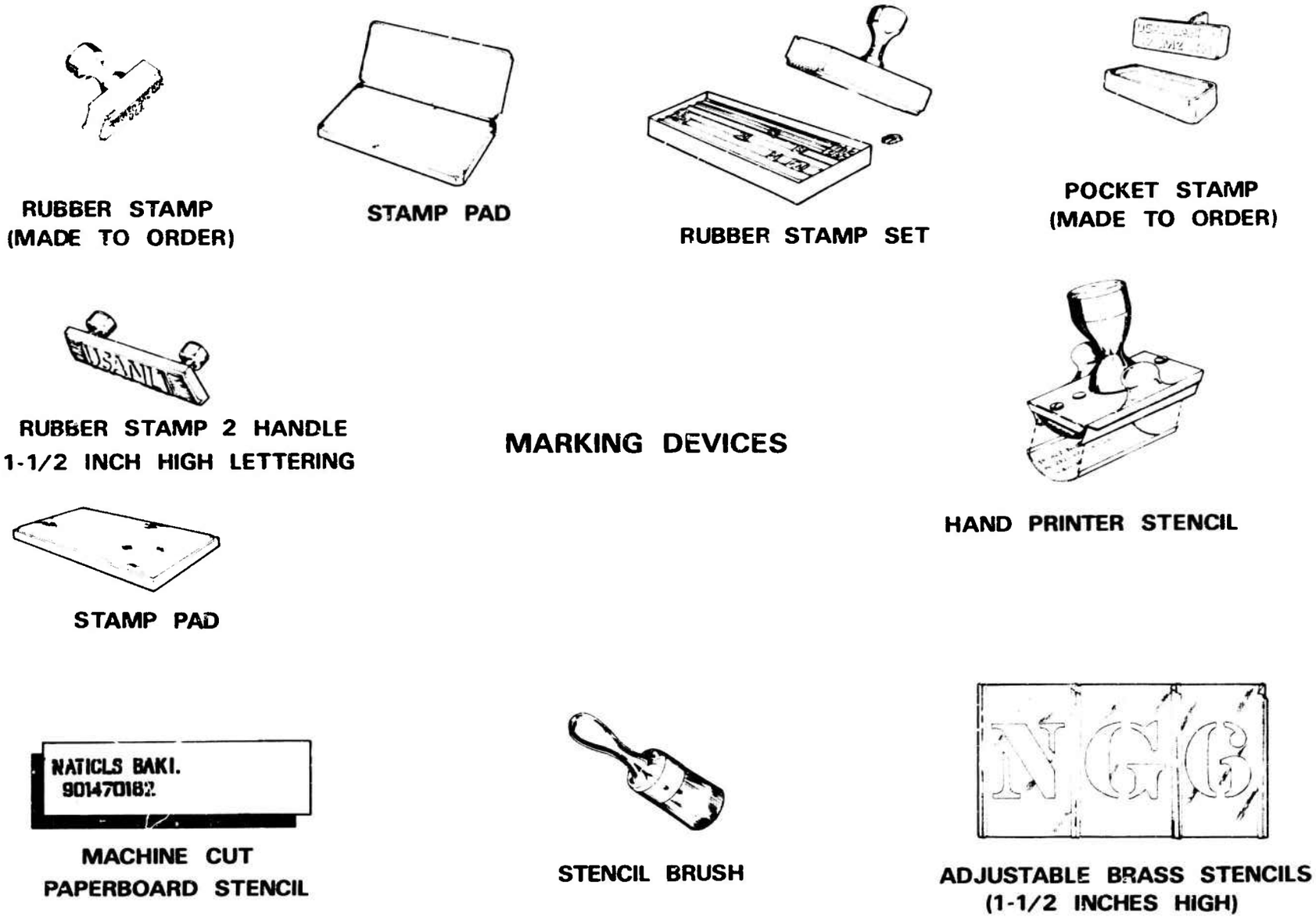

Figure 2. Fixed print lettering system for marking individual clothing and equipment

4. Description of items and marking areas

a. Footgear

Footgear includes both combat boots and oxford dress shoes. The marking surface of the combat boot is rough, black leather. Figure 3 shows a proposed new marking location on a white cloth label attached to the gusset. The oxford dress shoe marking surface is a tan or gray, smooth-finish, calfskin leather. Marking is applied below the eyelets.

b. Headgear

The headgear group includes garrison, service and utility caps and helmet liner. All caps and helmet liner are marked on the right front of the sweatband, or on the underside of the sweatband if it can be turned down.

c. Belt, trousers, cotton

The trouser belt is made of a black, coarsely woven cotton webbing. Army regulations specify that the marking be placed on the inside of the belt approximately six inches from the metal tip. Figure 3 shows a new recommended location which includes a white cloth label for marking. The label should be located at the inside of the belt around 3 to 4 inches from the buckle.

d. Headband for helmet liner

The headband is made of a light tan, smooth, soft sheepskin leather. The marking should be placed on the headband at the right front side of the wearer.

e. Duffel bag

The duffel bag is marked at the location specified in AR 746-10(2). The bag is made of OD-7 plain weave cotton duck #10, treated for water repellency and mildew resistance.

5. Evaluation methods

The marking materials and methods were evaluated on each of the selected clothing and equipment items subjectively for ease of application, legibility, and uniformity. Marks and inks were judged on a poor, good and excellent basis as shown in Table I. Testing for durability consisted of immersing marked items in 70°F water for 24 hours (Table I).

6. Results

Preliminary investigations showed that all items except combat boots and web belts could be marked effectively on exposed surfaces. White ink used to mark the latter items penetrated the surface excessively and produced faint markings.

TABLE I

Comparative Data On Commercial Marking Systems

Marking Systems	Characteristic	Items: 1/ Boot	Shoe	1/ Belt	Headgear: Service	Garrison	Field	Headband	2/ Duffel Bag	3/ Water Resistance (Durability All Inks Passed i.e. Remained Indelible
Rubber Stamps	Ease of Application	1	1	1	1	1	1	1	1	
	Legibility	1	1	1	1	1	1	1	1	
	Uniformity	1	1	1	1	1	1	1	1	
Stencil Hand Printer	Ease of Application	1	2	1	1	2	2	1	N/A	
	Legibility	1	2	1	1	2	2	1		
	Uniformity	1	2	1	1	2	2	1		
Pens: Drawing, Ball Point, and Nylon	Ease of Application	1	1	1	1	1	1	1	N/A	
	Legibility	2	2	2	2	2	2	2		
	Uniformity	2-3	2-3	2-3	2-3	2-3	2-3	2-3		
Markers: A, B, C, D, and E	Ease of Application	1	1	1	1	1	1	1	N/A	
	Legibility	2	2	2	2	2	2	2		
	Uniformity	2-3	2-3	2-3	2-3	2-3	2-3	2-3		

Rating Code:
1 - Excellent
2 - Good
3 - Poor

1/ White label attachment - DDD-L-20 (Material only)
2/ Used two handle rubber stamp with 1-1/2 inch high lettering
3/ Ink marks on leather material were immersed in water at 70°F. for 24 hours

An inquiry into some current methods of direct marking by Army personnel showed in some instances, a deviation of direct marking to items. One example involved applying white paint or white tape to the item and then marking on this white background using common marking devices such as brushes and stamps. Since commercial white inks are not effective in direct marking of the combat boot or web belt, alternate marking devices were considered or evaluated for these two items.

a. Labels*

A white cotton label attachment was considered for subsequent marking (boots and belts only). The label may be sewn or attached by an adhesive. Both methods were assessed for their application and manufacturing process. For the combat boot, the label is centered horizontally on the gusset (Figure 3). All Army web belts are made by the Institute of the Blind Industries, Washington, D.C. and NLABS was informed that a label sewing operation would create a handicap. As a result, it was suggested that the label be attached by adhesive methods. Because of the item wear characteristics, it was proposed that the best suited position for the label was to place its nearest edge approximately 3 to 4 inches from the buckle end of the belt (Figure 3). Other methods considered for marking belts and boots included mechanical etching of the belt buckle using a sharp tool, e.g., a nail, and leathercraft branding of the combat boot.

b. Advantages and disadvantages of various marking systems

The merits and shortcomings of a representative marker of each type investigated (see Table I for detailed data including individual markers), are as follows:

(1) Penmanship type markers

Penmanship type markers by their design features, inherently can be used to mark all clothing items with relative ease. Pen marking with legibility and sustained uniformity on leather and fabric surfaces is dependent on each individual's printing ability. The quality and durability (water resistance) of the mark made by the pen devices will vary according to the quality of the ink incorporated in the manufacturing of the marker. Many of the commercial pen devices used were satisfactory. However, there is no assurance that pen markers made at some future time will imprint an effective and lasting mark on leather and fabric surfaces.

(2) Fixed printing lettering

Rubber stamp (commercial)

A ready-made rubber stamp imprinted with the individual's name and Social Security number will produce legible and uniform lettering. Durability of the lettering may be obtained by using currently available standard laundry ink (ink pad type) that meets the necessary requirements for laundering properties.

*Although a white cotton label is more legible, an O.D. colored label could provide a subdued camouflage effect to the item. If the subdued effect is desired, an established nylon O.D. tape in conjunction with a specially compounded ink is available and would produce a durable marking system.

Figure 3. Marking areas for selected clothing and equipment

a. Hand printer stencil (proprietary)

This stenciling device will reproduce standard typewritten lettering with legibility and uniformity provided a stencil ink is used. The cutting of the stencil may be done with a typewriter or by hand printing with a ball-point pen. Because of the stencil design, this device is not as versatile as the rubber stamp since it cannot be used in narrow areas such as those in narrow sweat bands in headgear or right uppers of oxford garrison shoes.

7. Conclusions

A study produced several satisfactory methods for marking individual items of clothing and equipment. They included:

a. Pen varieties

(1) Ball-point
(2) Drawing pen
(3) Nylon point
(4) Markers (proprietary)
(5) Rubber stamp (hand)
(6) Hand stencil (proprietary)

B. All of the proceding methods incorporating black ink can be used directly to mark all items effectively, except on the dark surfaces of the combat boot and web belt. Boots and belts are not readily markable. This deficiency, however, can be overcome by first attaching a white cotton cloth label which is marked in the same way as the other items. The alternate new surface would necessarily have to be light colored with a smooth texture for the use of a uniform marking system. These surface qualities were found in three of the following components:

a. Unmarked, coated white cloth labels
b. White plastic decalcomania, heat transfer film
Plastic coating (acrylic polymer paint applied by brush)

C. With the addition of a white label to combat boots and web belts, all clothing can have a uniform marking using one color of ink (black) which may be applied by various devices. This would eliminate the need for using white marking ink as described in AR 746-10(2).

D. The common commercial rubber stamp marks the most clearly and uniformly, while maintaining durability on all clothing items, provided a white label has been previously attached to the belt and boots.

E. The standard cotton duffel bag can be easily and effectively marked at training centers, either by use of paperboard stencils, brush and ink, provided a standard stencil ink is specified for that particular use. The introduction of nylon duffel bags (nonstandard) into the supply system initiated the requirement for a specified nylon stenciling ink.

8. Recommendations

On the basis of the above findings, it is recommended that:

a. An unmarked white cloth label* conforming to specification DDD-L-20

be permanently attached to the combat boot and web belt during manufacture. The boot label should be sewn on its four sides on the inside of the gusset and the belt label should be fastened to the web belt by an adhesive.**

b. A commercial, fixed print, hand rubber stamp and pad with ink conforming to TT-I-542 be established as a uniform standard marking system.***

c. No change be made in the method for marking duffel bags except that standard stencil inks be specified for that application: TT-I-559 or TT-I-98 for the standard cotton duffel bag, and MIL-I-6903 for the nonstandard nylon duffel bag.

d. A stamp kit, including pad and ink be developed.

e. A training manual with instructions for marking clothing and equipment be developed.

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*The label shall be TYPE I of DDD-L-20, except that class and printing requirements shall not apply. The label shall be clean, unmarked, 3 1/2-inches long by 1-inch wide for the combat boot and 4 inches long by 1 inch wide for the web belt (locations shown in Figure 1).

**Sole manufacturer of the web belt is Institute of the Blind, Washington, D.C.

***Commercial rubber stamp lettering 3/16-inch high, Gothic style print, one or two lines as applicable. Pad (commercial) with size dependent on size of rubber pad used.

9. References

1. Letter to CG, NLABS, from Adjutant General AGSC-C-DCSPER, dated 4 March 1968. Subject: "Development of Marking Ink for Individual Items of Clothing".

2. Army Regulation AR 746-10, "Marking of Selected Clothing and Equipment," dated 20 October 1969.

3. Letter to Military Training Center from NLABS AMXRE-CCP, dated 29 July 1968.