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Malmstrom

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[54] **DISPOSABLE LANCET**

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[73] Assignee: **Swedish Hospital Supply SHSAB,** Malondal, Sweden

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Related U.S. Application Data

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[52] **U.S. Cl.** **29/415**

[51] **Int. Cl.** **B21d 28/06**

[58] **Field of Search** ..... 113/116 BB; 29/412, 415, 29/416, 417; 128/314

[56] **References Cited**

UNITED STATES PATENTS

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FOREIGN PATENTS OR APPLICATIONS

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Attorney, Agent, or Firm—Albert L. Jeffers; Roger M. Rickert

[57] **ABSTRACT**

A disposable lancet used for piercing the tissue of a finger to obtain blood specimens. The lancet is designed to contain minimum material to achieve low material costs which still have the strength and rigidity to be completely functional. The lancet design permits multiple lancets to be punched from a strip of sheet steel to obtain economy in the manufacturing operation.

4 Claims, 2 Drawing Figures

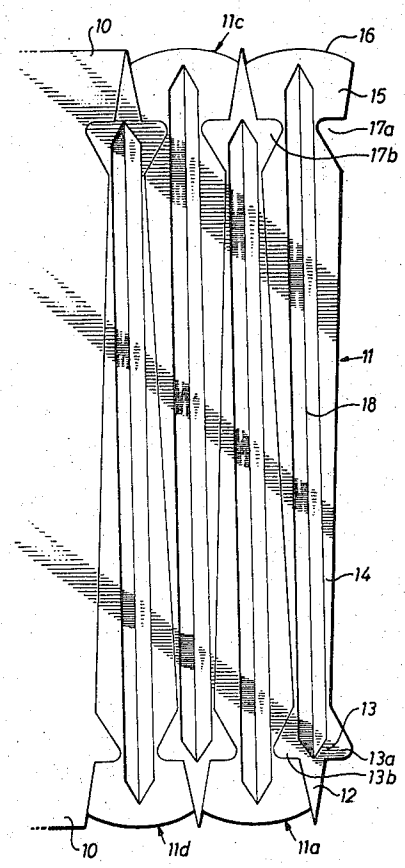


Fig. 1

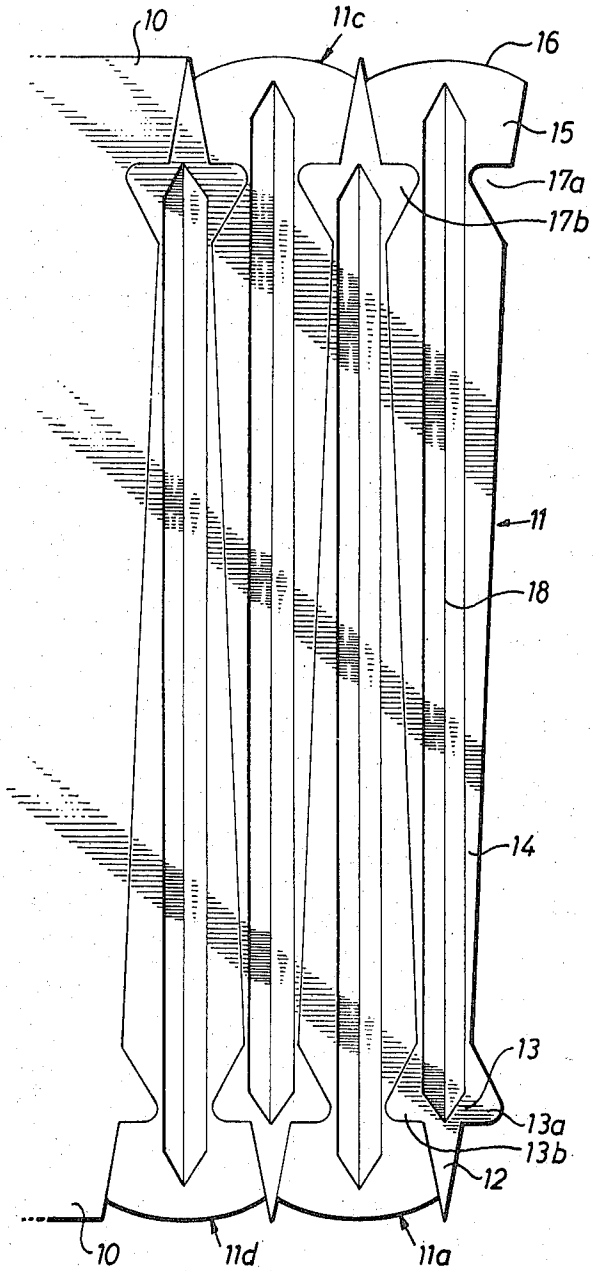
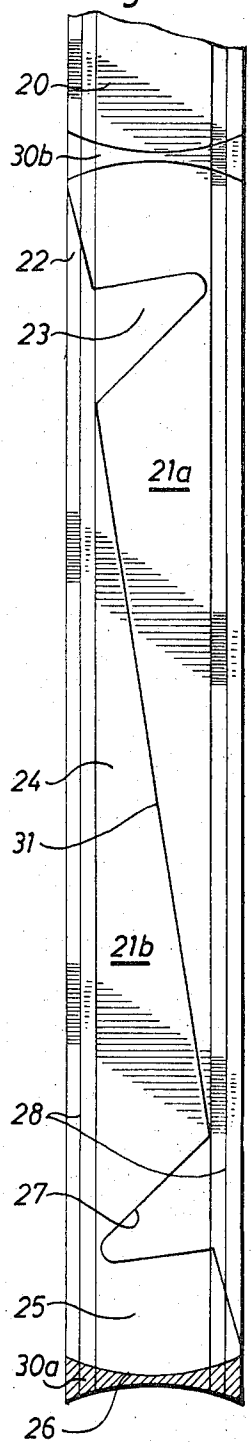

10
11c
16
15
17a
17b
11
18
14
13
13a
13b
12
10
11d
11a

Fig. 2


20
30b
22
23
21a
24
31
21b
28
27
25
30a
26

DISPOSABLE LANCET

RELATED APPLICATION

This is a Divisional Application of my co-pending application, Ser. No. 182,862, filed Sept. 22, 1971.

BACKGROUND OF THE INVENTION

The invention described herein relates to surgical instruments and more particularly to a lancet used for collecting small amounts of blood for test purposes.

A lancet is a surgical instrument having a sharp pointed end used for piercing the tissue of a patient's finger to obtain blood specimens. It is manufactured from stainless steel and comprises a piercing portion having a sharp point which merges into a shoulder of substantially greater width which restricts the penetration depth of the lancet. The shoulder is integrally formed with a relatively long handle or grip portion having an outer end (pressure surface) against which a person's thumb is placed for pushing the pointed end of the lancet into the tissue of a finger.

Conventional lancets of this kind have a handle or grip portion of uniform width, and the handle width is determined more with regard to the required size of the pressure surface and the shoulder than with regard to the required stiffness of the lancet.

As a result, the handle includes substantially more material than is necessary for the lancet to perform its intended function. It has been estimated that the cost for materials in a lancet constitutes more than 40 percent of the lancet sales price and it therefore is obvious that reduction in the amount of material used will be reflected in reduced costs to the purchaser. Also, for both medical and economic reasons, a lancet is used only once and then discarded and this fact accordingly dictates that the lancet must be designed to achieve acceptable performance at the lowest manufacturing and material costs.

The present invention reduces the material and manufacturing costs for a lancet by about 50 percent. This reduction is obtained by the fact that the shoulder is connected with the handle by means of a neck portion having reduced width in relation to the shoulder and that the width of the handle increases from the width of the neck portion at the connection thereto in the direction of the free end of the handle. Another feature is that the handle is provided with recesses which are of the same size and shape as the shoulder portion or sections thereof. For example, the shoulder portion comprises two sections symmetrically positioned or only one section positioned at one side of the lancet.

To obtain economy in the manufacturing process, lancets preferably are stamped from strips having substantially the same width as the entire length of each lancet, one lancet being positioned in one direction and the adjacent lancets being positioned in the opposite direction, the sections of the shoulder of one lancet being formed by corresponding recesses in the adjacent lancets.

SUMMARY OF THE INVENTION

Briefly stated, the above disadvantages of the prior art are eliminated by providing a disposable lancet which contains the minimum amount of material necessary to impart strength and rigidity to the lancet structure while still permitting the lancet to perform its intended function at an optimum performance level. To achieve manufacture of a lancet at minimum costs, a manufacturing process is used wherein a strip of sheet steel is moved cyclically into a punch press and multiple lancets simultaneously are stamped or punched from the steel strip.

An object of the invention is to provide a highly functional lancet capable of being manufactured at low cost; and

Another object of the invention is the provision of an improved manufacturing process which stamps or punches multiple lancets from strips of sheet steel.

BRIEF DESCRIPTION OF THE DRAWING

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter of the invention, it is believed the invention will be better understood from the following description taken in conjunction with the accompanying drawing, wherein:

FIG. 1 is a plan view of a steel strip illustrating multiple lancets punched therefrom during a manufacturing operation; and

FIG. 2 shows a plan view of a modification of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing wherein like reference characters designate like or corresponding parts, there is shown in FIG. 1 a strip **10** of stainless steel or other material preferably having a thickness of 0.15 to 0.20 mm and of a length sufficient to stamp out multiple lancets during the manufacturing operation. The plan view of FIG. 1 shows the configuration of each lancet **11** as the manufacturing proceeds. To acquire perspective on the size, the lancets of FIG. 1 are shown magnified about five times the actual size of a lancet used for blood specimen purposes.

Each lancet **11** is provided with a piercing portion having a sharp point **12** which enters the tissue of a patient's finger when the lancet is being used. The piercing portion uniformly increases in width from point **12** and merges in a shoulder **13** having two reversed sections **13***a* and **13***b* of the same shape symmetrically positioned with respect to the longitudinal axis of the lancet. The function of the shoulders is to restrict the distance that the piercing portion may be inserted in a finger and the piercing portion length may obviously vary depending on lancet use.

The shoulder **13** is of substantially the same shape as an equilateral triangle, one point of the triangle being directed opposite to the point **12** and which merges into a grip portion or handle **14.** As shown, the handle **14** increases in width in the direction of the handle free end **15** which is rounded to provide a pressure surface or area **16** against which a person's finger may be placed for pushing the lancet point **12** into a patient's finger. The handle is provided with recesses **17***a* and **17***b* to help minimize the amount of material used. A longitudinal depression **18** extends from the free end along the handle length to the piercing portion for imparting strength and rigidity to the lancet.

The lancet is preferably manufactured by a stamping or punching operation. Referring to FIG. **1,** as the stainless steel strip **10** is fed into a machine having a die shaped to the configuration of a lancet, and the ma-

chine cycled for a first stamping operation, the lancet 11a is first stamped out. The previously stamped lancet 11 is then detached from the strip although in the usual operation, the cut will be clean and the lancet will fall into a collecting bin.

As the strip steel is fed into the machine for the next cut and again cycled, the lancet **11***d* is stamped out and the lancet **11**c detached, and so on, until the strip is exhausted. It will be noted that two lancets are formed by each stamping operation, thus doubling the speed of production over prior methods. Further, the design of the lancet has been chosen to utilize to the maximum extent, all the material in the steel strip. Reference to FIG. **1** shows that the only material wastage is that small amount between the pressure surface **16** and the edge of the strip.

Consideration of the lancet design and the manufacturing process used in forming the lancet shows that substantial savings in material over prior art designs has been achieved. This saving coupled with doubling the lancet production speed has resulted in an overall cost reduction of approximately 50 percent.

In the embodiment of FIG. **1,** the lancets are stamped from strips having substantially the same width as the entire length of each lancet, one lancet being positioned in one direction and the adjacent lancet being positioned in the opposite direction, with the sections of the shoulder of one lancet being formed by the corresponding recesses in the adjacent lancets.

In the modification of FIG. **2,** the lancets are manufactured by being stamped from strips having substantially the same width as the maximum width of the grip portion or handle, one lancet being positioned in one direction and the adjacent lancet being positioned in the opposite direction, and the shoulder of each lancet being formed by a corresponding recess in the handle of the adjacent lancet.

In FIG. **2,** two lancets **21***a* and **21***b* are stamped from the strip **20** in a single operation. As is evident, the width of the strip equals the greatest width of each of the lancets.

Each lancet comprises a piercing portion **22** which merges into a single shoulder **23** asymmetrically positioned on one side of the lancet. The shoulder **23,** which is substantially triangular in shape, continues into the grip portion or handle **24** of the lancet. The width of the handle increases in the direction of the free end **25** and is rounded to provide a pressure surface **26.** A recess **27** having the same configuration as the shoulder **23** is formed in the free end **25** of the handle. As in the preferred embodiment, the strip **20** is provided with two stiffening depressions **28** to impart strength and rigidity to the lancet.

In the manufacturing operation, the section **30***a* is first separated from the strip to form the pressure surface **26** on the lancet **21***a*. The strip **20** is fed forward along the length of one lancet and is cut at **31** to separate the two lancets **21***a* and **21***b* from each other. The section **30***b* is then stamped out either during the same operation when cut **31** is made or in a separate operation. Upon separation of the two lancets, each will be provided with sharp points **22** as a result of cutting along the length and into the edge of the strip material.

In view of the above, it will be apparent that many modifications and variations are possible in light of the above teachings. It therefore is to be understood that within the scope of the appended claims, the invention may be practised other than as specifically described.

What I claim as new and desire to secure by United States Letters Patent is:

1. A method of manufacturing a lancet of the type having a piercing portion on one end of a steel strip and a shoulder integrally formed therewith and extending outwardly and perpendicularly to the lancet longitudinal axis, said lancet further being of the type having a handle connected with said shoulder and gradually increasing in width toward the other end of said strip, a pressure surface on said other end, and recesses adjacent said other end which are complementary to said shoulder, comprising the steps of:

stamping lancets from a steel strip having substantially the same width as the entire length of each lancet, and wherein alternate lancets are positioned with the piercing portion in one direction and the lancets adjacent said alternate lancets are positioned with the piercing portion in the opposite direction, and the shoulder of one lancet being formed by corresponding recesses in an adjacent lancet, each stamping line defining one side edge of each of two adjacent and oppositely directed lancets, each stamping line having a portion defining one side edge of the piercing portion of one of the adjacent lancets and a portion of one side edge of the handle of the other lancet, a portion defining one side edge of the shoulder of one of the lancets and a recess in the handle of the other lancet, a portion defining a portion of one side edge of the handles of each lancet, a portion defining a recess in the handle of one of the adjacent lancets and one side edge of the shoulder in the other lancet, and a portion of one side edge of the handle of one lancet and a portion defining one side edge of the piercing portion of the other lancet.

2. A method of manufacturing a lancet of the type having a piercing portion on one end of a steel strip and a shoulder integrally formed therewith and extending outwardly and perpendicularly to the lancet longitudinal axis, said lancet further being of the type having a handle connected with said shoulder and gradually increasing in width toward the other end of said strip, a pressure surface on said other end, and recesses adjacent said other end which are complementary to said shoulder, comprising the steps of:

stamping lancets from a strip of stainless steel having substantially the same width as the maximum width of said handle, and wherein alternate lancets are positioned in one direction and lancets adjacent said alternate lancets are positioned in the opposite direction, and the shoulder of one of said lancets being formed by a corresponding recess in the handle of the other lancet, each stamping line defining one side edge of each of two adjacent and oppositely directed lancets, each stamping line having a portion defining one side edge of the piercing portion of one of the adjacent lancets and a portion of one side edge of the handle of the other lancet, a portion defining one side edge of the shoulder of one of the lancets and a recess in the handle of the other lancet, a portion defining a portion of one side edge of the handles of each lancet, a portion defining a recess in the handle of one of the adjacent lancets and one side edge of the shoulder in

the other lancet, and a portion of one side edge of the handle of one lancet and a portion defining one side edge of the piercing portion of the other lancet.

3. The method of claim 2 further comprising the steps of providing each lancet with a stiffening depression and stamping a portion of the steel strip to define the pressure surface of an individual lancet.

4. The method of claim 1 further comprising the steps of providing each lancet with a stiffening depression and stamping a portion of the steel strip to define the pressure surface of a lancet prior to the step of stamping that lancet from the steel strip.

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