

June 30, 1970

I. A. SPEELMAN
BLOOD-LETTING LANCET
Filed Nov. 9, 1967

3,517,670

FIG. 1

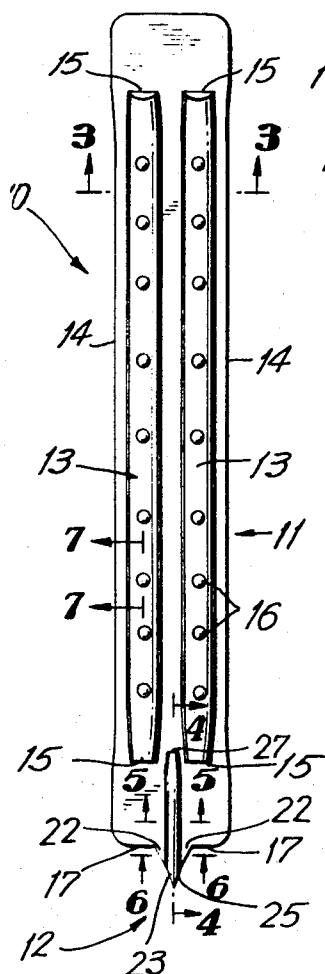


FIG. 2

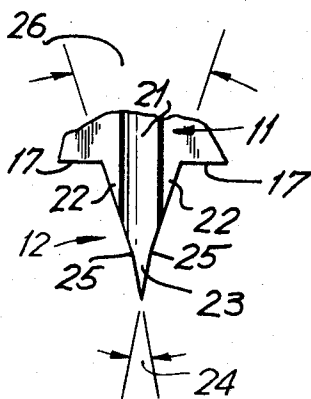


FIG. 3

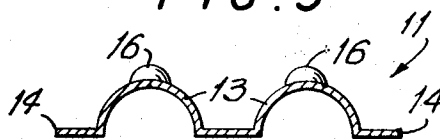


FIG. 4

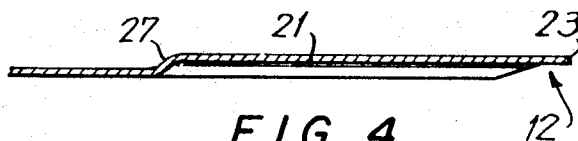


FIG. 5



FIG. 6

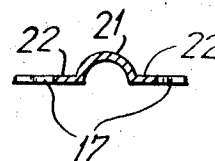


FIG. 7

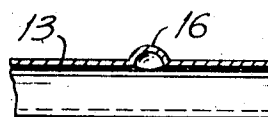
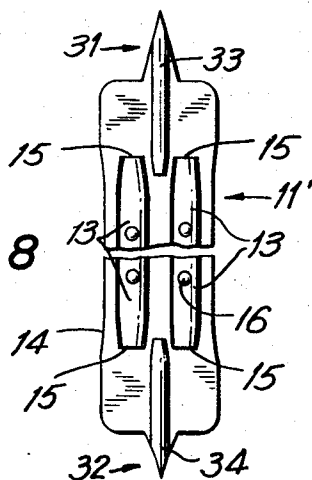


FIG. 8



INVENTOR.
IRVING A. SPEELMAN

BY

Blum, Moscovitz, Friedman, Blum & Kaplan
ATTORNEYS

1

2

3,517,670

BLOOD-LETTING LANCET

Irving A. Speelman, Roslyn Heights, N.Y., assignor to
Propper Manufacturing Co., Inc., Long Island City,
N.Y., a corporation of New York

Filed Nov. 9, 1967, Ser. No. 681,664

Int. Cl. A61b 17/32, 17/34

U.S. Cl. 128—314

7 Claims

ABSTRACT OF THE DISCLOSURE

A blood-letting lancet having a plurality of stiffening ribs spaced inwardly of the longitudinal side edges of the body of said lancet and terminating in said body in substantially squared ends, and one or two substantially flat pointed portions extending longitudinally from the end of ends of said body, said point or points having a relatively narrow longitudinal stiffening rib extending into said body portion. The points of the double-pointed lancet are of different lengths.

BACKGROUND OF THE INVENTION

This invention relates to an improved disposable blood-letting lancet constructed to enable blood samples to be withdrawn from the superficial capillaries of the body by piercing or puncturing the skin of an individual so that the blood which leaves the capillaries can be collected from the surface of the skin. The collection of blood by this procedure is well known in medical practice and is used for many purposes including estimating red and white blood cell count, determining blood groups and Rh types and for the preparation of blood slides for microscopic examinations.

Experience has taught that the re-use of blood-letting lancets can lead to the spread of various diseases due to inadequate sterilization. For this reason it has become common to use disposable blood-letting lancets in the above-mentioned procedures. However, disposable lancets, in order to be economically feasible, must be inexpensive to manufacture. Thus, a practical blood-letting lancet must be manufactured by a process requiring a minimum number of steps and the least expensive material. These goals are normally achieved by using lancets made of thin strips of metal. However, such strips generally lack the rigidity required in an effective lancet.

It is also well known that the length of the piercing point of a blood-letting lancet depends on the nature of the subject. Thus a child with soft, thin skin would require a short-pointed lancet while a laborer, having calloused hands, would require a lancet having a longer point. However, the lancets known in the art are of one or the other length but are not suitable for use on both types of patients.

SUMMARY OF THE INVENTION

Generally speaking, in accordance with the invention, a blood-letting lancet is provided having a plurality of ribs formed in its body, said ribs being spaced inwardly of the longitudinal side edges of said body and terminating in said body in substantially squared ends. The lancet has one or two piercing points extending longitudinally from the end or ends of said body, said pointed portions being substantially flat and having a relatively narrow longitudinal rib extending into said body. The piercing points of the double-pointed lancet are of different lengths.

Accordingly, it is an object of this invention to provide a disposable blood-letting lancet which is easily used and inexpensive to manufacture.

Another object of the invention is to provide a blood-letting lancet which, although made of a thin sheet-metal,

is sufficiently rigid to inhibit deformation or bending when used in accordance with normal procedures, viz, inserted in the capillary bed of the patient.

A further object of the invention is to provide a blood-letting lancet which can be used on patients having skin of various degrees of thickness.

Still another object of the invention is to provide a blood-letting lancet which will easily puncture the skin with a minimum of pain to the patient, while providing a puncture sufficiently enlarged to permit the flow of blood.

Still other objects and advantages of the invention will in part be obvious and in part be apparent from the specification.

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

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the invention, reference is had to the following description taken in connection with the accompanying drawing, in which:

FIG. 1 is a top plan view of one type of blood-letting lancet constructed in accordance with the invention;

FIG. 2 is an enlarged fragmentary bottom view of the piercing point thereof;

FIGS. 3, 5 and 6 are transverse sectional views taken along the lines 3—3, 5—5 and 6—6 respectively of FIG. 1.

FIGS. 4 and 7 are longitudinal sectional views taken along the lines 4—4 and 7—7 respectively of FIG. 1; and

FIG. 8 is a fragmentary view, similar to FIG. 1, showing a modified form of lancet of double-pointed construction.

Referring now to FIGS. 1 through 7, the blood-letting lancet 10 depicted therein consists of a substantially rectangular body portion shown generally at 11 and a pointed portion shown generally at 12. Formed in the body portion 11 are a pair of stiffening ribs 13 spaced inwardly of the longitudinal side edges 14 of said body and terminating inwardly of the ends of said body portion. The termination of all sides of said ribs 13 in the body 11 markedly improves the rigidity of said body as compared to the termination of either the sides or ends of said ribs at the edges of said body 11, as is the case in the known blood-letting lancets having stiffening ribs. It has been found that at least two of such ribs are required in order to prevent deformation or bending of the body 11 during insertion of the pointed portion into the patient's skin. The termination of ends 15 of said ribs 13 in substantially squared ends results in further improvement of the rigidity of said body portion 11. Maximum stiffening is obtained if the longitudinal axes of said ribs 13 are substantially parallel to the longitudinal axis of the pointed portion 12 as in the case of the preferred embodiment. Stated otherwise, the longitudinal axes of said ribs 13 should preferably extend in the direction of the thrust of the lancet into the patient.

In the embodiment of the invention, the ribs 13 have a semi-circular cross-section. The exact shape of this cross-section is not essential to my invention and any substantially arcuate cross-section can be utilized. In addition, if the width of the lancet permits, more than two stiffening ribs may be incorporated in the body of the lancet. Further, while in the preferred embodiment, the body portion 11 is substantially rectangular, this is given by way of example and not limitation.

Uniformly spaced longitudinally along the top of said ribs 13 are dimples 16. These dimples provide a gripping surface for the user to prevent the lancet from slipping during insertion into the skin. It should be noted that these dimples are not essential to the operation of the lancet or the stiffening ribs.

The pointed portion 12 is substantially flat and formed with a relatively narrow longitudinal rib 21 extending into said body portion and terminating therein adjacent to the ends of said ribs 13 at a substantially squared end 27. The narrow longitudinal rib 21 defines two coplanar flat flanges 22 along the portions of the outer edges of said pointed portion adjacent to the body portion 11. Further, the piercing point area 23, while extending from the top wall of said longitudinal rib 21, is also substantially flat. The flat piercing point area 23 and flanges 22 provide the optimum cutting configuration for ease of insertion and minimizing pain to the patient. The cutting angle of a pointed portion having an arcuate section throughout its length continuously changes, requiring additional pressure for insertion into the skin and causing increased pain to the patient. Only a small portion of the pointed portion 12 of the lancet according to the invention has such an arcuate section. The longitudinal rib 21 serves the dual purpose of stiffening the point to prevent bending thereof during insertion into the skin and stretching the wound to permit the free flow of blood from the capillaries. This latter gapping function is particularly clear at the portions of the longitudinal rib 21 adjacent to the flanges 22.

It has been found that the angle 24 formed by the intersection of the side edges of the piercing point area 23 should be about 20 degrees in order to ease initial penetration and minimize pain to the patient. The side edges of the pointed portion 12 of the embodiment of the invention shown in FIGS. 1 through 7 do not extend in a straight line from the piercing point area 23 to the body portion 11, but rather, have a discontinuity at point 25 so that the portions of said side edges adjacent to the body portion 11 describes an angle 26 substantially larger than the angle 24. This arrangement permits the longitudinal rib 21 to be sufficiently wide and deep to stiffen the pointed portion and stretch the wound while insuring that the flat flanges 22 extend sufficiently far in the direction of the piercing point in order to optimize cutting action. In addition, this arrangement results in a pointed portion having a widened base adjacent to the body portion so that the incision is correspondingly wide to insure proper bleeding. The embodiment of the invention shown in FIGS. 1 through 7 is short-pointed, having a pointed portion 12 preferably of a length of about 0.094 inch. The long-pointed embodiment of the invention would preferably be of a length of about 0.156 inch. The sides edges of the pointed portion of such long-pointed lancets need not have a discontinuity at point 25, but rather, such side edges extend in a straight line from the piercing point area 23 to the body portion 11. This arrangement results in effective pointed portions in long-pointed lancets since the increased length permits the side edges of the pointed portion to diverge at the preferred angle of about 20 degrees while defining a pointed portion having enlarged flanges and a broadened base.

The base of the pointed portion 12 is narrower than the width of body portion 11, so that two penetration-limiting shoulders 17 are formed by said body. In operation, the blood-letting lancet according to the invention would be grasped at the body 11 between the thumb and opposing fingers of the user. The pointed portion of the lancet is stabbed, using a longitudinal thrust, into the skin of the patient's finger or other part of the body as may be desirable, until the penetration-limiting shoulder abuts the skin. The lancet is then removed permitting the flow of blood from the capillary bed.

I have found that the blood-letting lancet according to the invention can be readily formed from sheet-metal having a thickness greater than 0.0025 inch and less than 0.0075 inch, using conventional stamping procedures. Thus, both the pointed portion 12 and the stiffening ribs 13 can be formed in a single operation without additional grinding.

The body portion 11 is substantially rectangular and in a preferred embodiment has a width of about 0.205 inch.

In this same embodiment, the lancet would be of a length of about 1.5 inches while the stiffening ribs 13 would be of a width of about 0.050 inch. The longitudinal rib 21 would be of a width of about 0.025 inch while the base of the pointed portion 12 would be of a width of about 0.52 inch.

Referring now to FIG. 8, a second embodiment of the invention having a pointed portion 31 at one end and a pointed portion 32 extending longitudinally from the opposite end of the body portion 11'. The body portion 11' is substantially identical to the body portion 11 of the blood-letting lancet shown in FIGS. 1 through 7. Both pointed portions 31 and 32 are substantially flat and are formed with longitudinal ribs 33 and 34 respectively extending into the body portion 11'. The pointed portion 32 is substantially identical in configuration to pointed portion 12 of FIG. 1. The pointed portion 31 differs from the pointed portion 32 only in that it is longer than said pointed portion 31 and its side edges are uniform and devoid of a discontinuity such as the discontinuity at point 25 of FIG. 1. Such a discontinuity is not required in a longer point since the intersection of the side edges of the pointed portion can still describe the optimum angle of about 20 degrees while providing a sufficiently wide base and flanges adjacent to said body portion. Thus, the side edges of the piercing point of both the first and second pointed portions describe substantially the same angle at their intersection. Pointed portions 31 and 32 are preferably of a length of 0.156 inch and 0.094 inch respectively. The embodiment of FIG. 8 thus permits a single blood-letting lancet to be used on all types of patients, be they children with thin skin or laborers with thick calloused skin.

It will thus be seen that the objects set forth above, and those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above constructions without departing from the spirit and scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intending to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. A blood-letting lancet comprising a body portion of an elongated strip material of uniform thickness having a plurality of longitudinal ribs spaced inwardly of the longitudinal side edges thereof, said ribs terminating inwardly of the ends of said body portion; and a pointed portion extending longitudinally from one end of said body portion and integral therewith, said pointed portion being substantially flat and having a pair of side edges converging in a piercing point, said pointed portion having a relatively narrow longitudinal rib extending from said piercing point into said body portion to a point inwardly of the adjacent end of said body portion ribs, said pointed portion rib defining substantially flat coplanar flanges along the portions of the side edges of said pointed portion adjacent to said body portion.

2. A blood-letting lancet as recited in claim 1, wherein said body portion ribs terminate in substantially squared ends.

3. A blood-letting lancet as recited in claim 1, wherein said body portion ribs are formed with a plurality of raised dimples on their outer surface for providing gripping surfaces for the fingers of a user.

4. A blood-letting lancet as recited in claim 1, wherein said pointed portion is formed from a single member, the converging side edges thereof each having a first and second portion respectively, said side edges first portions being adjacent to said body portion, said side edges second portions intersecting to define said piercing point, the angle

5

described by said intersection being less than the angle described by the intersection of the longitudinal extension of said side edges first portions.

5 5. A blood-letting lancet as recited in claim 1, including a second pointed portion extending longitudinally from the other end of said body portion and integral therewith, said second pointed portion being substantially flat and having a pair of side edges converging in a second piercing point, said pointed portion having a relatively narrow longitudinal rib extending from said second piercing point into said body portion to a point inwardly of the adjacent end of said body portion ribs, said second pointed portion 10 rib defining substantially flat coplanar flanges along the portions of the side edges of said second pointed portion adjacent to said body portion, said second pointed portion being of a length different from the length of said first mentioned pointed portion. 15

6. A blood-letting lancet as recited in claim 5, wherein said first mentioned pointed portion is about 0.094 inch long and said second pointed portion is about 0.156 inch long.

7. A blood-letting lancet as recited in claim 5, wherein the angles described by the portions of the converging side

6

edges adjacent said first mentioned and second piercing points being substantially equal.

References Cited

UNITED STATES PATENTS

523,950	7/1894	Thompson	30—348 X
864,812	9/1907	Thuillier	128—314 X
1,642,390	9/1927	Tekker	30—366 X
1,802,289	4/1931	Swan	30—346.6
2,847,758	8/1958	Kozan	30—353 X
3,256,874	6/1966	DeMarco	128—305 X
2,880,000	3/1959	Unger	273—106.5
2,896,628	7/1959	Speelman	128—314
3,046,987	7/1962	Ehrlich	128—314

FOREIGN PATENTS

21,504 2/1901 Belgium.

ANTON O. OECHSLE, Primary Examiner

20 R. J. APLEY, Assistant Examiner

U.S. Cl. X.R.

30—348, 353; 128—2, 305