

[54] APPARATUS FOR TRACING PATTERNS FOR THE GARMENT INDUSTRY

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 131,905, April 7, 1971, abandoned.

[52] U.S. Cl. **33/11; 33/17 R; 33/174 B**

[51] Int. Cl. **A41h 3/01**

[58] Field of Search **33/11, 17 R**

[56] **References Cited**

UNITED STATES PATENTS

325,409	9/1885	Hendrick	33/11
1,011,915	12/1911	Carbonara	33/11

1,204,900 11/1916 Picken..... 33/11

FOREIGN PATENTS OR APPLICATIONS

21,408 11/1896 United Kingdom..... 33/11

Primary Examiner—Richard E. Aegerter
Assistant Examiner—Charles E. Phillips
Attorney, Agent, or Firm—Lawrence I. Field

[57] **ABSTRACT**

A device for designing a pattern for a garment, which device includes a table representing a key figure for each of a plurality of predetermined human body measurements, a first set of scales identified by key figures for defining predetermined measurements of the pattern, a plurality of cut-outs through the board carrying a second set of scales on their edges identified by corresponding key figures. The device is characterized in that one of the cut-outs is a dart indicating cut-out for designing a variable angle for determining a desired dart width.

11 Claims, 35 Drawing Figures

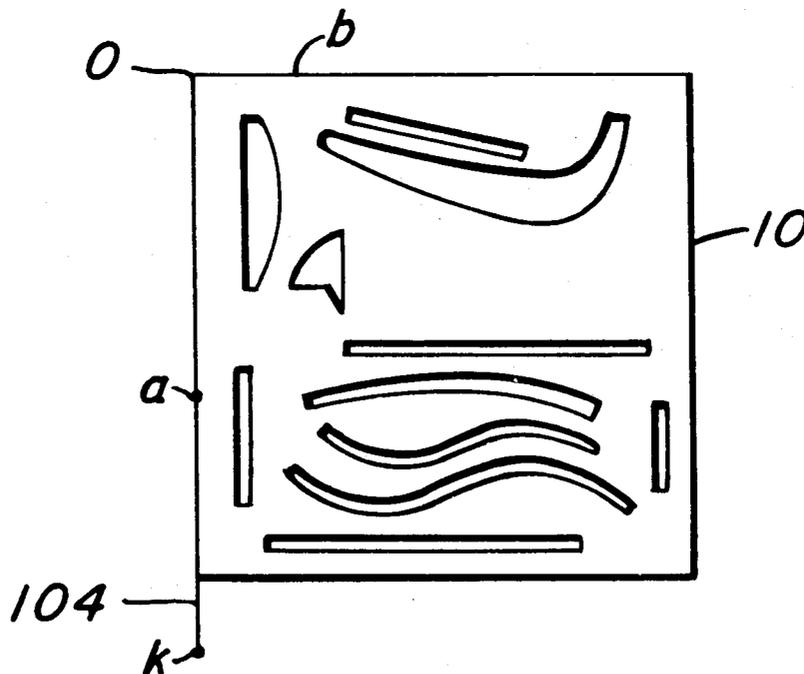


FIG. 1

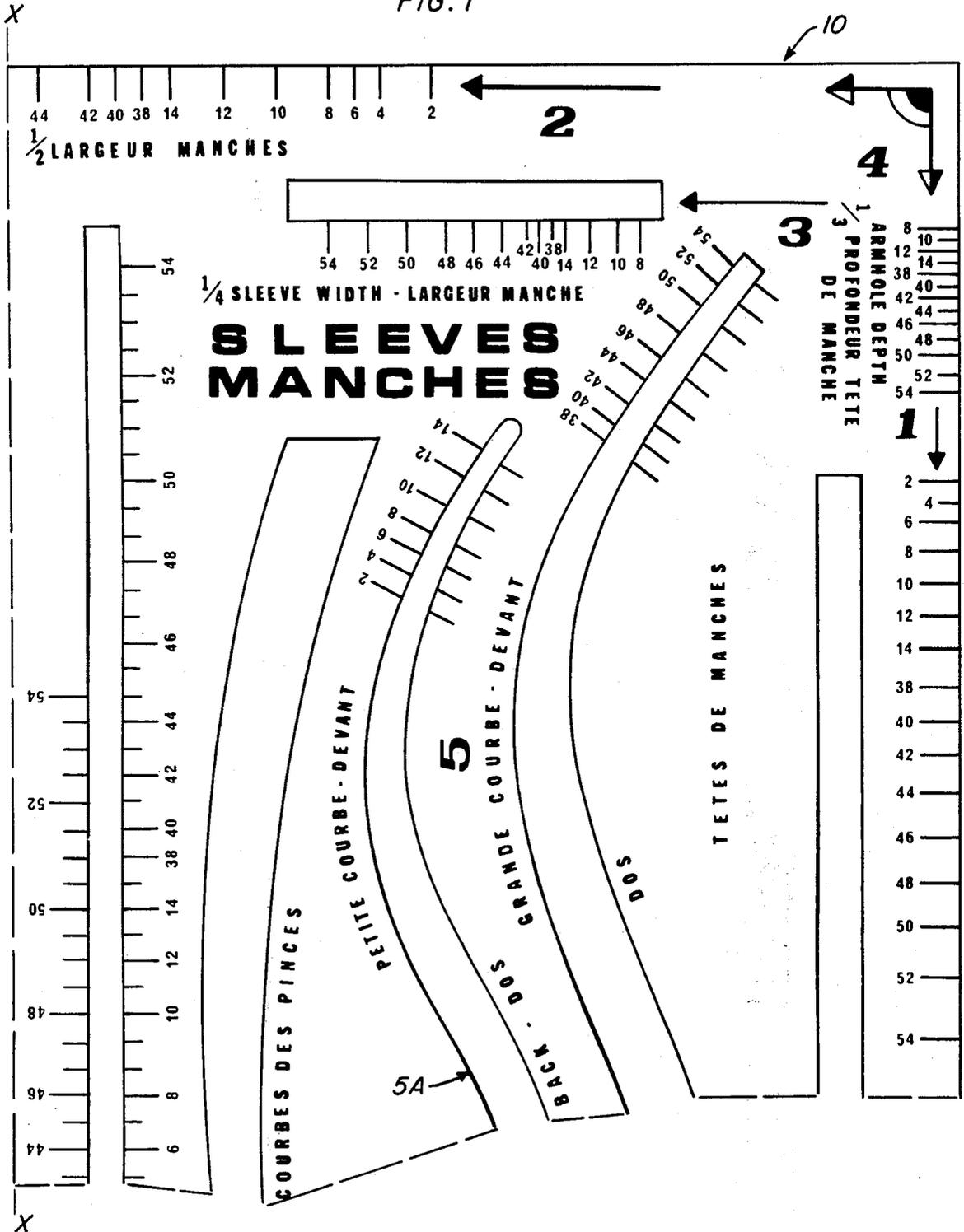


FIG. 1-A

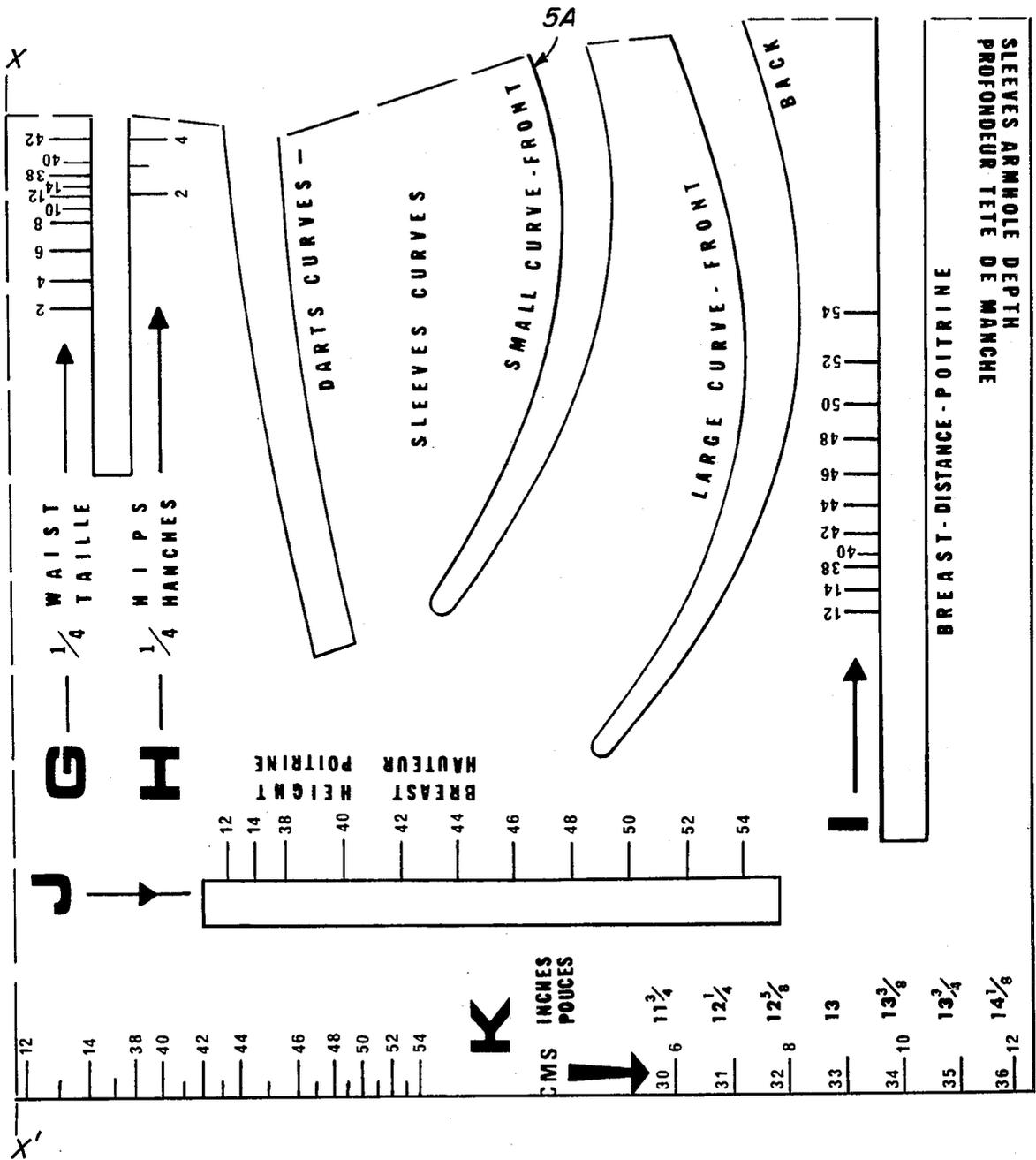


FIG. 1-B

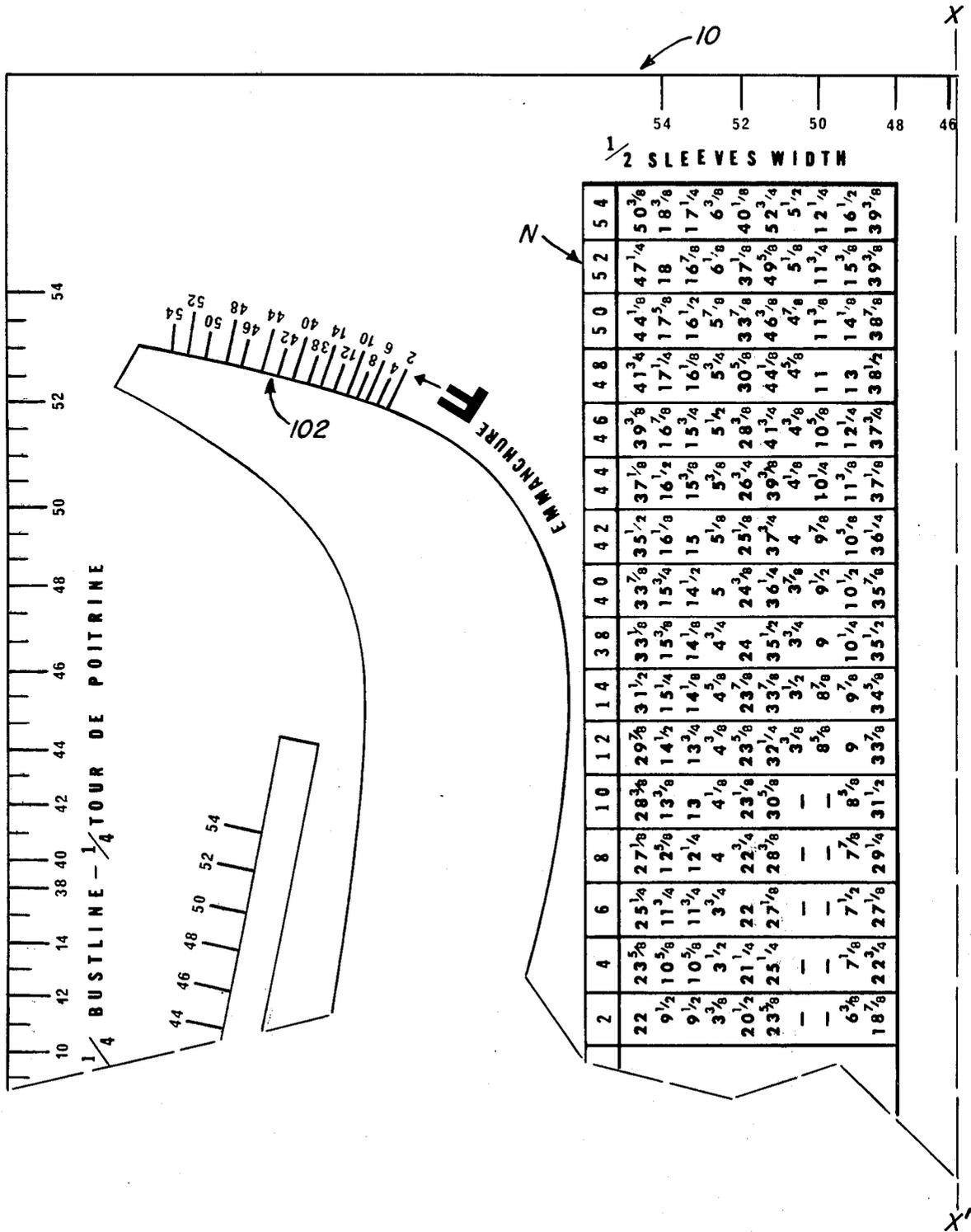
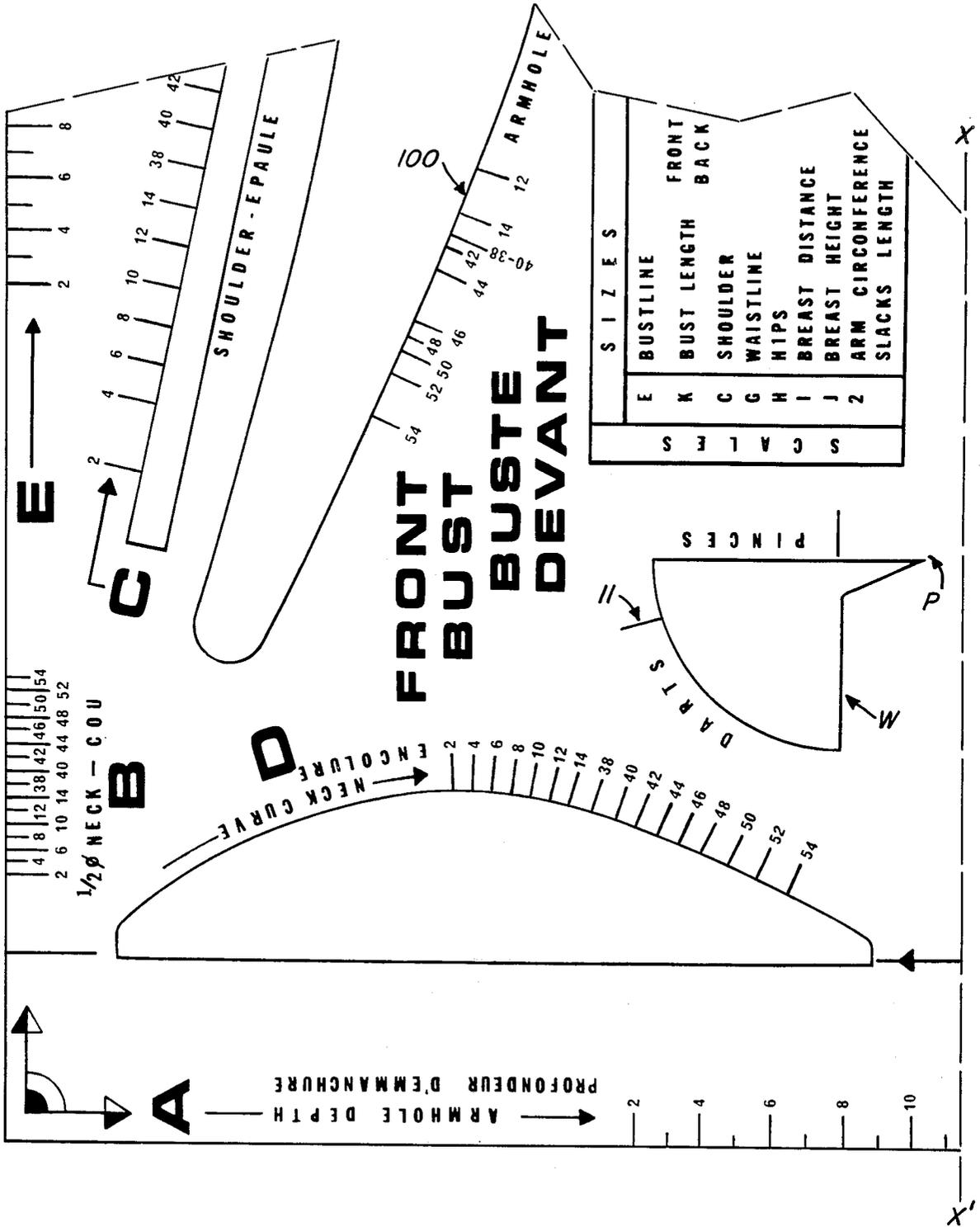


FIG. 1-C



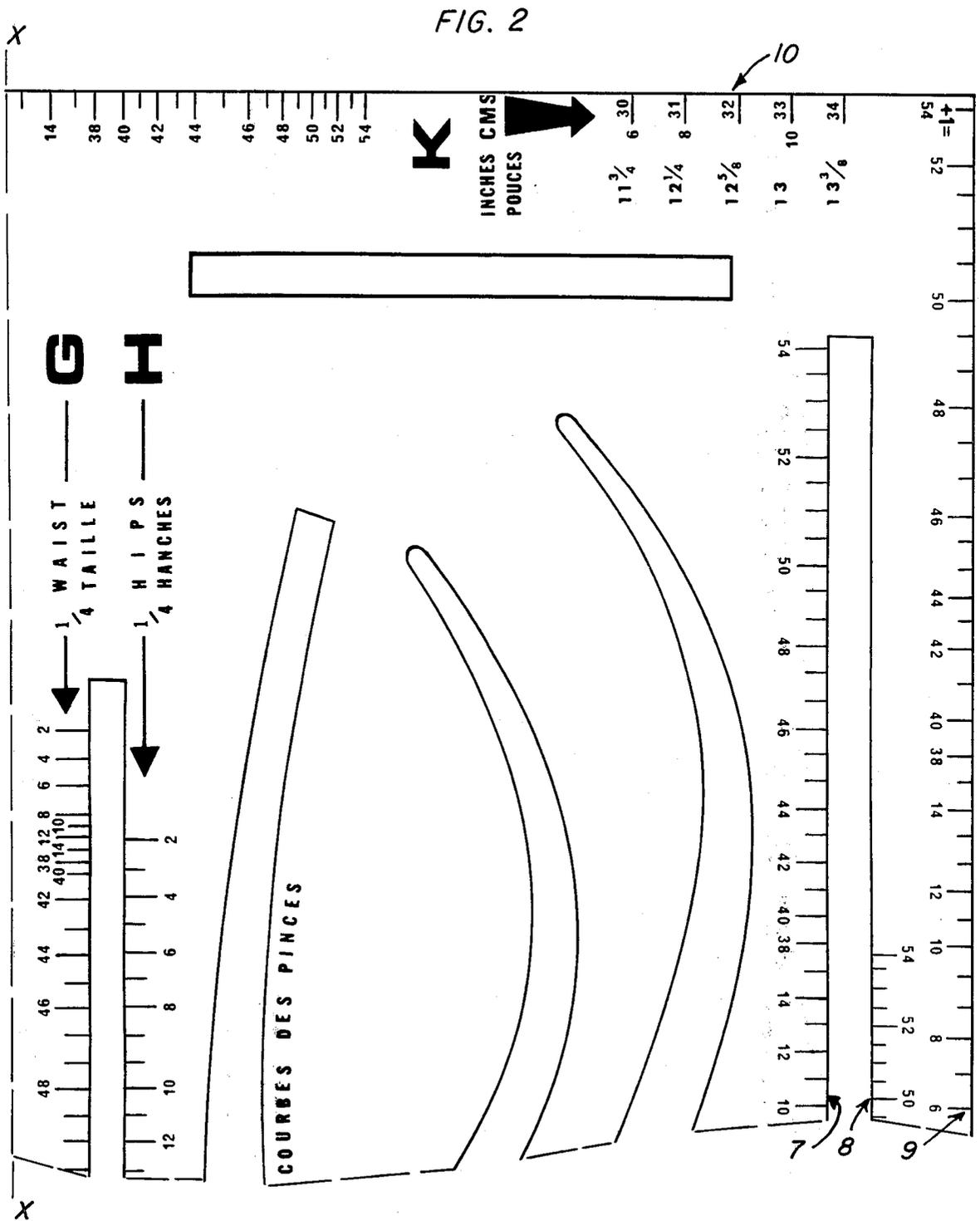


FIG. 2-A

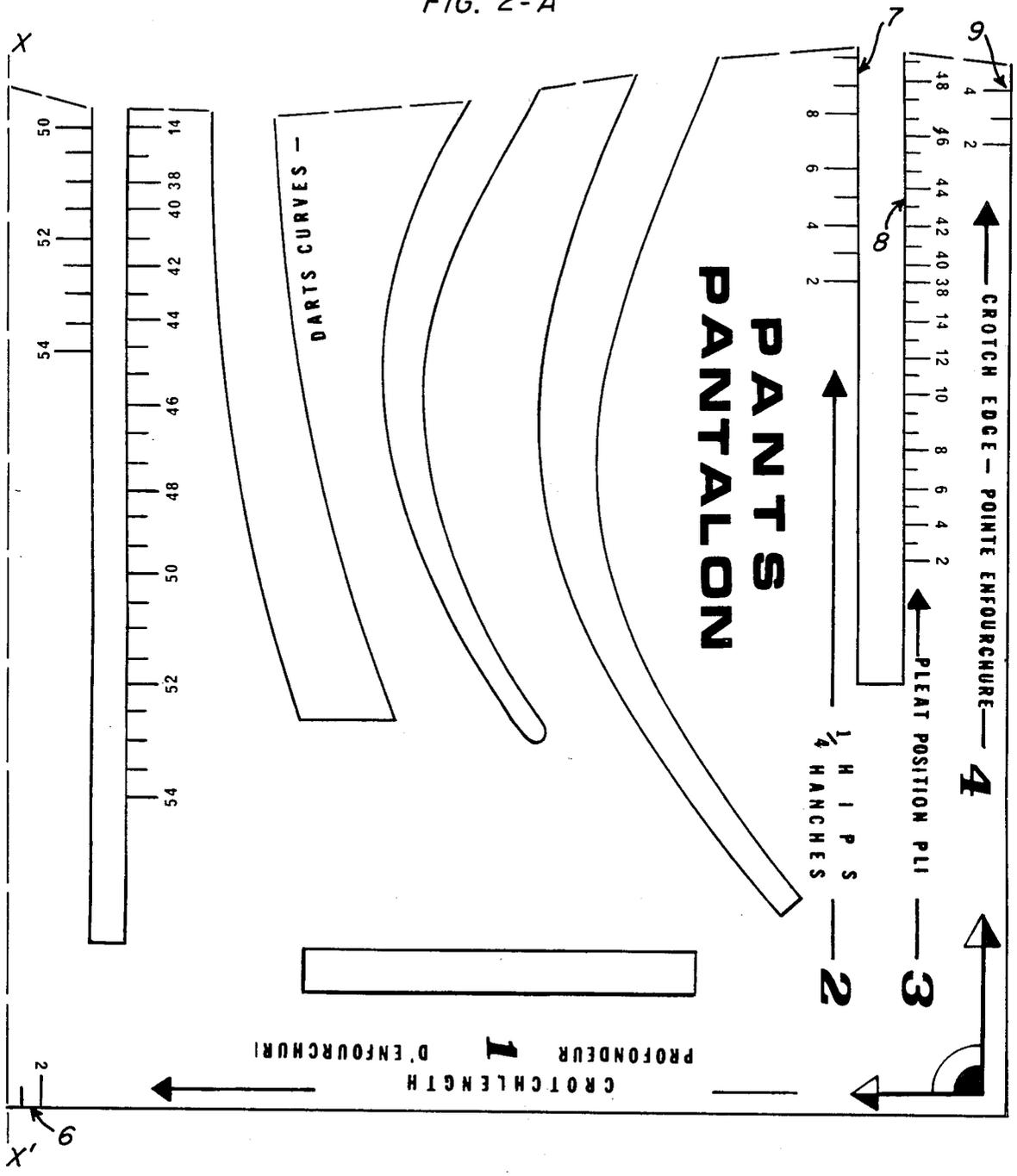


FIG. 2-B

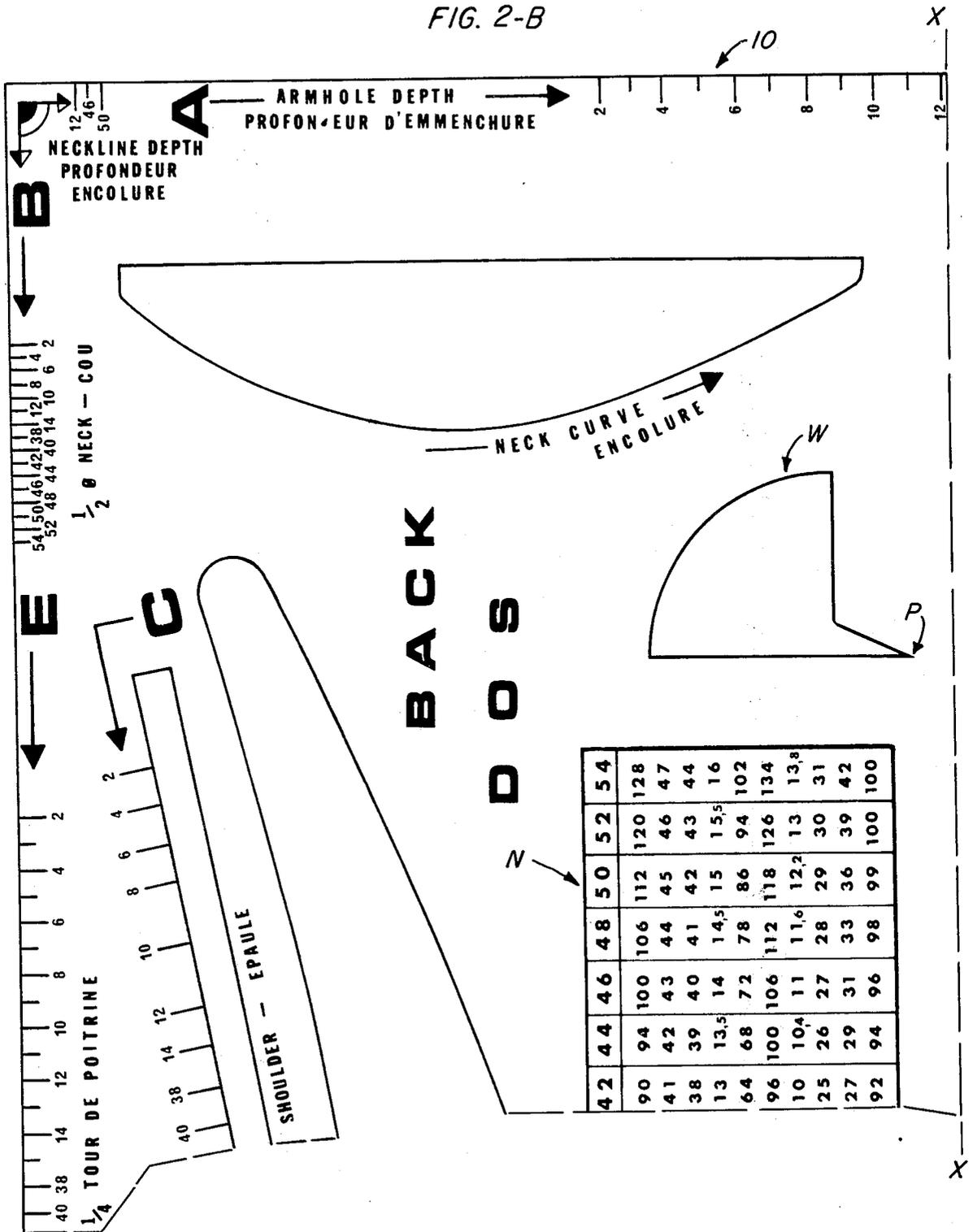


FIG. 2-C

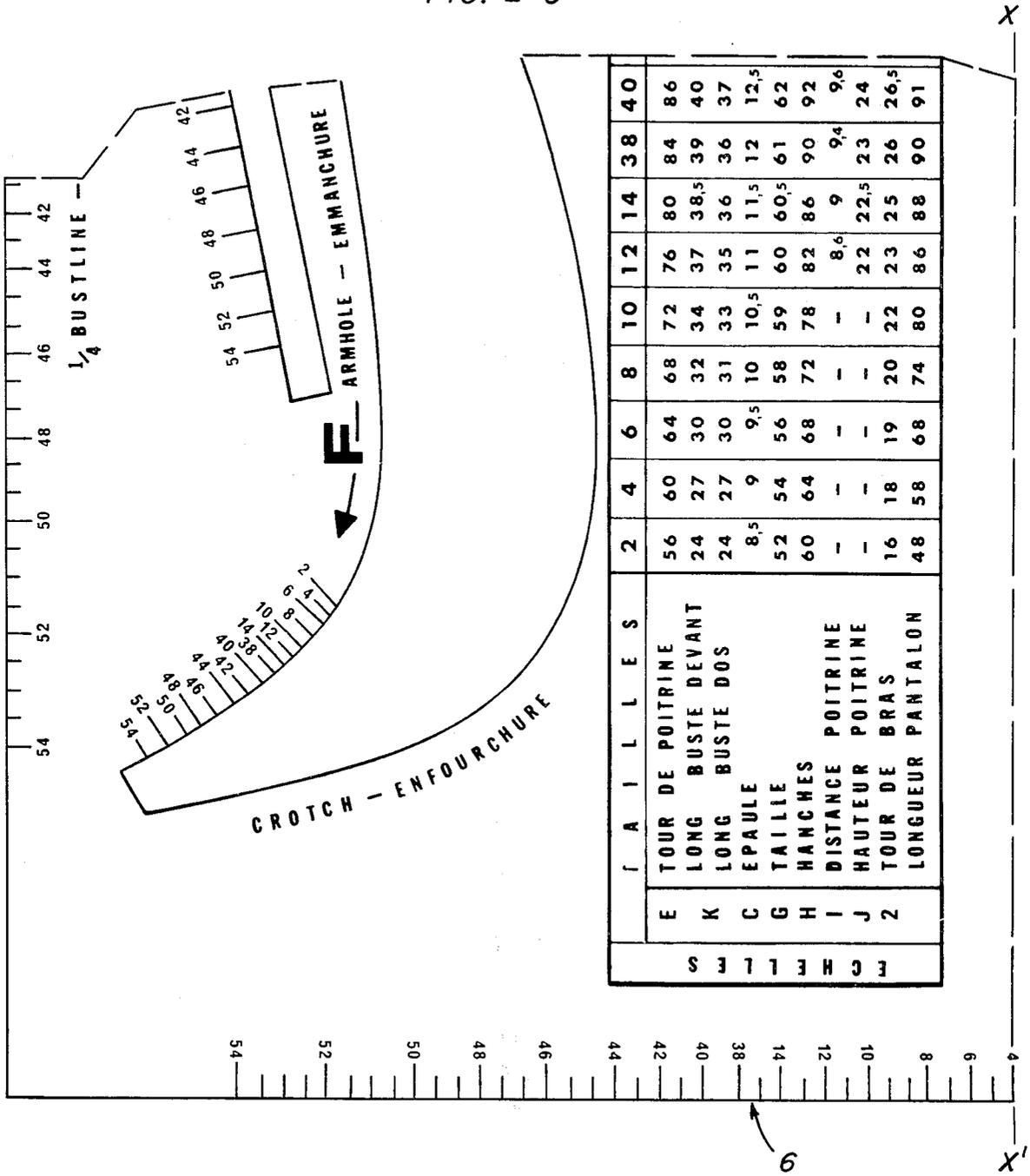


FIG. 4

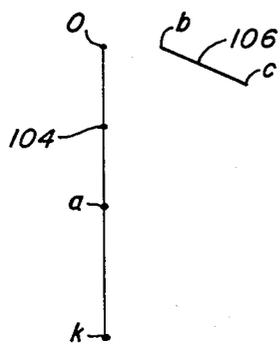


FIG. 3

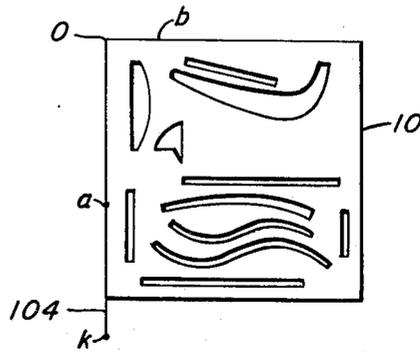


FIG. 5

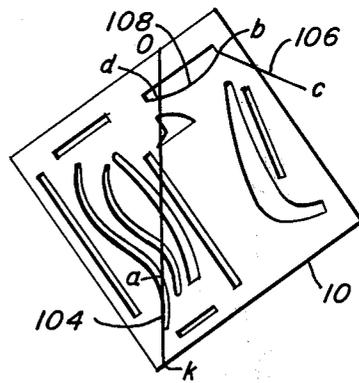


FIG. 6

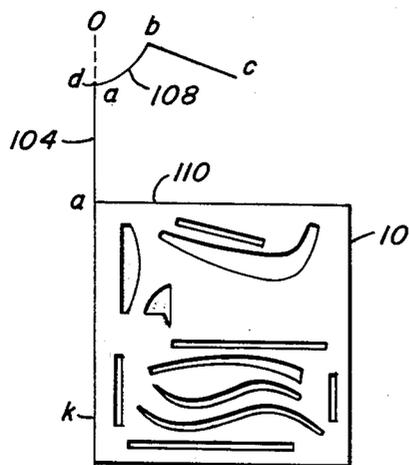


FIG. 7

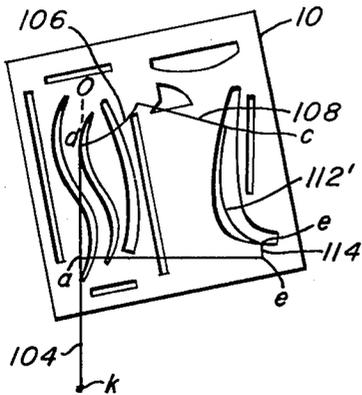


FIG. 8

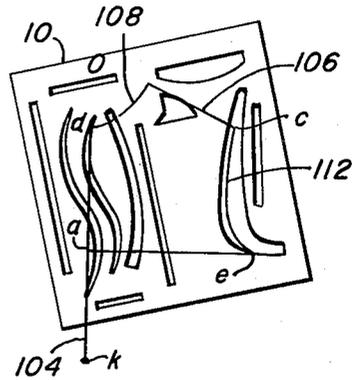


FIG. 9

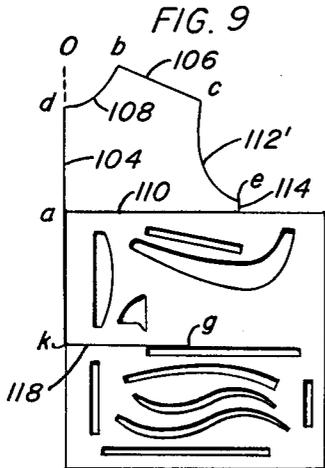


FIG. 10

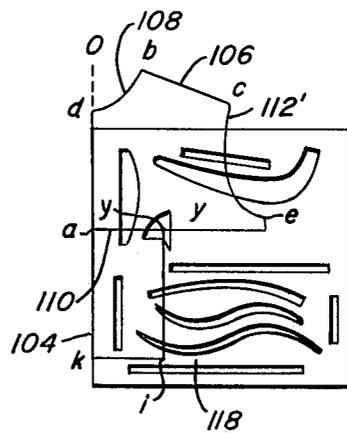


FIG. 11

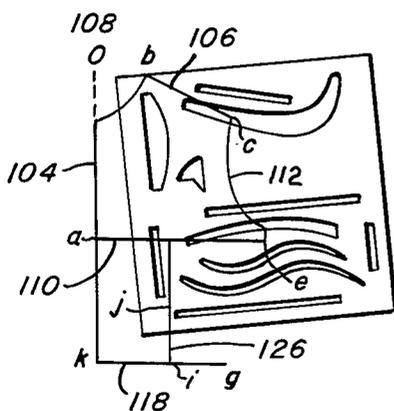
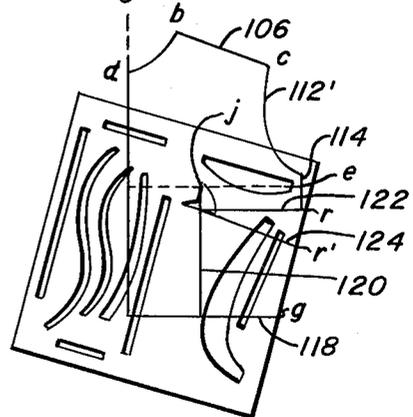


FIG. 12



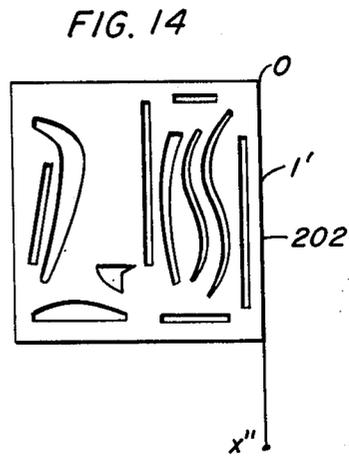
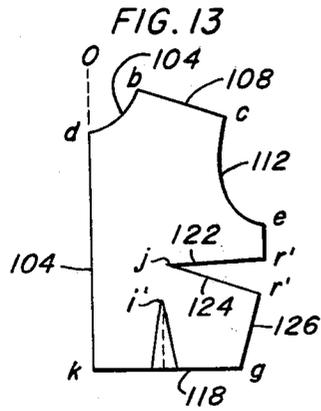


FIG. 16

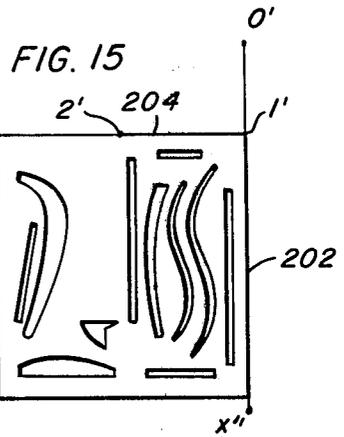
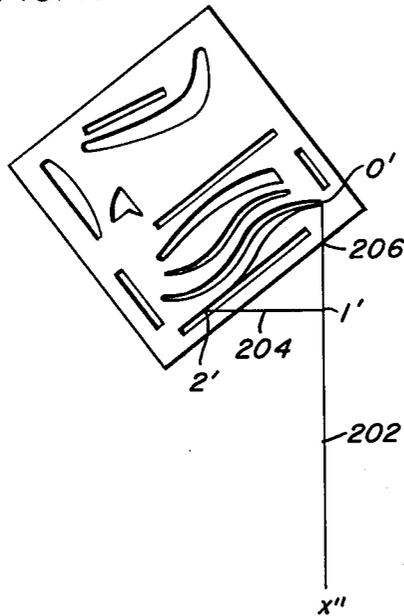


FIG. 15

FIG. 17

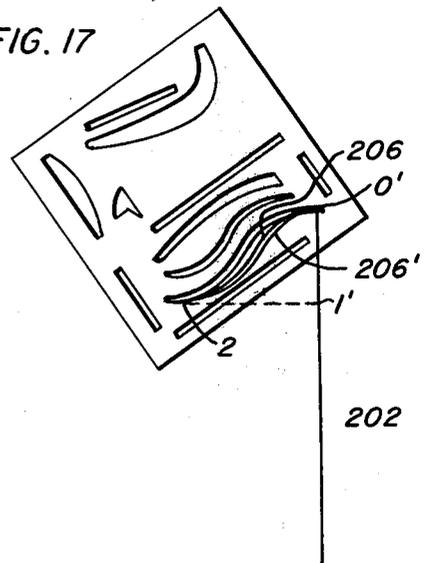
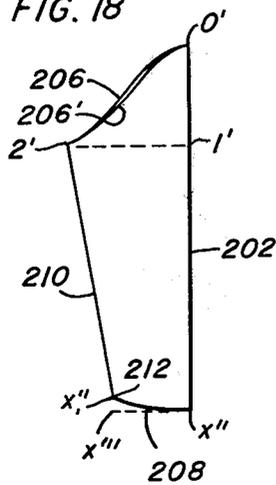
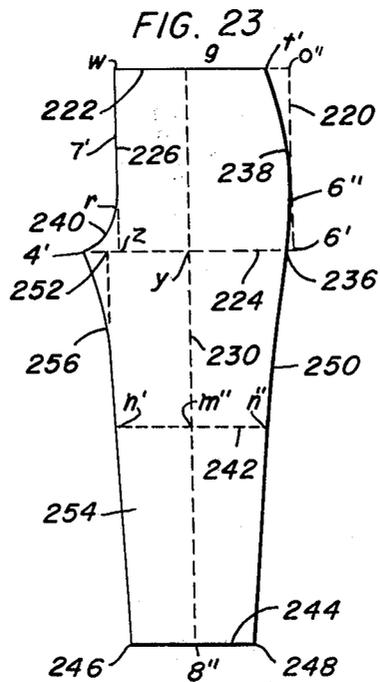
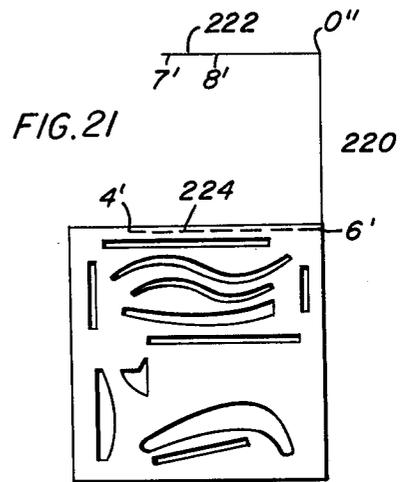
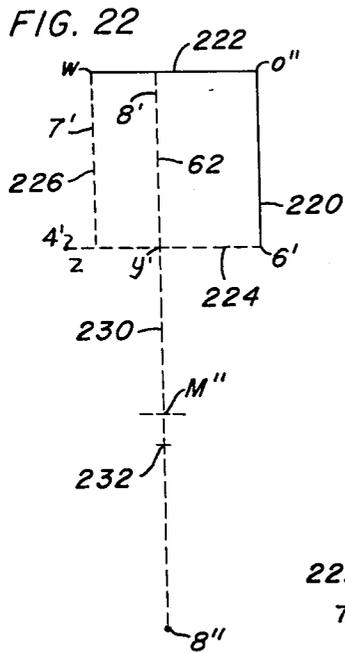
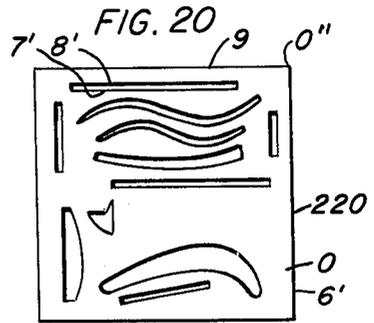
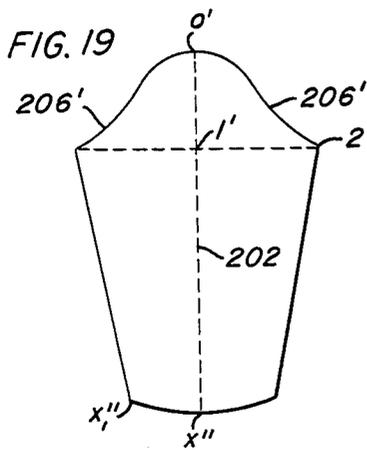


FIG. 18





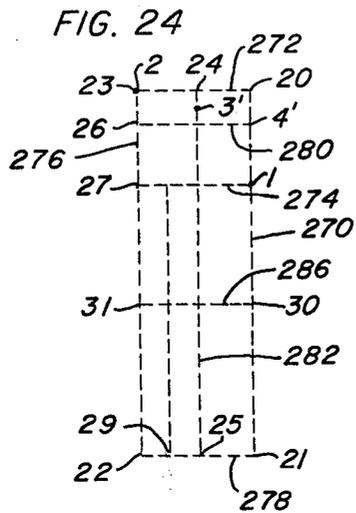


FIG. 25

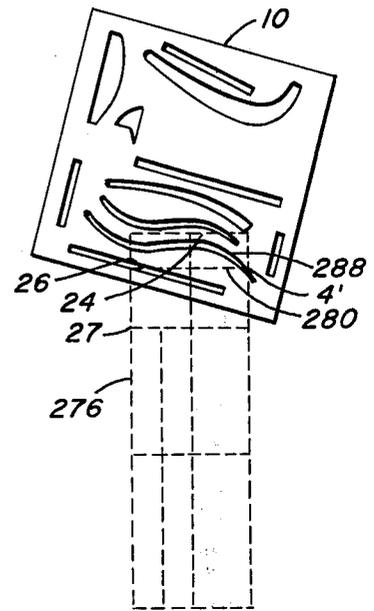


FIG. 26

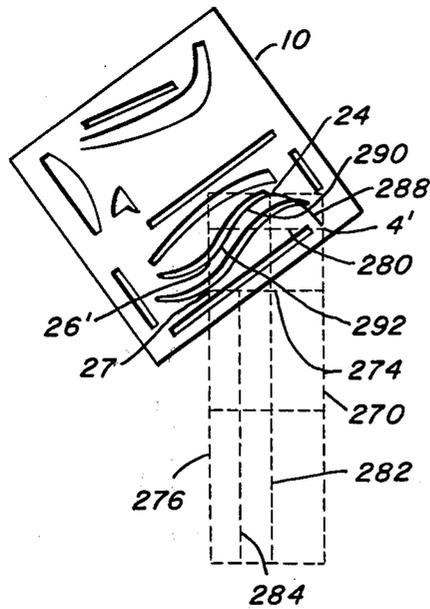
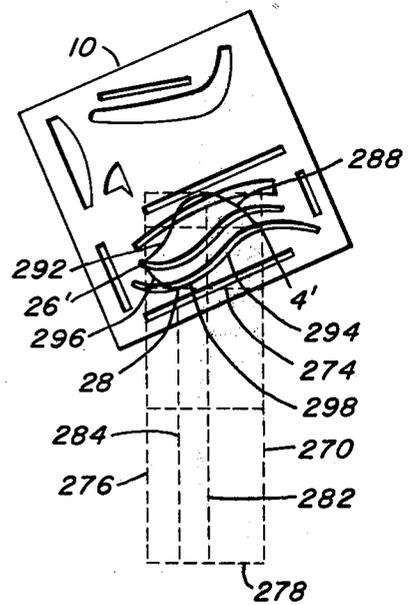


FIG. 27



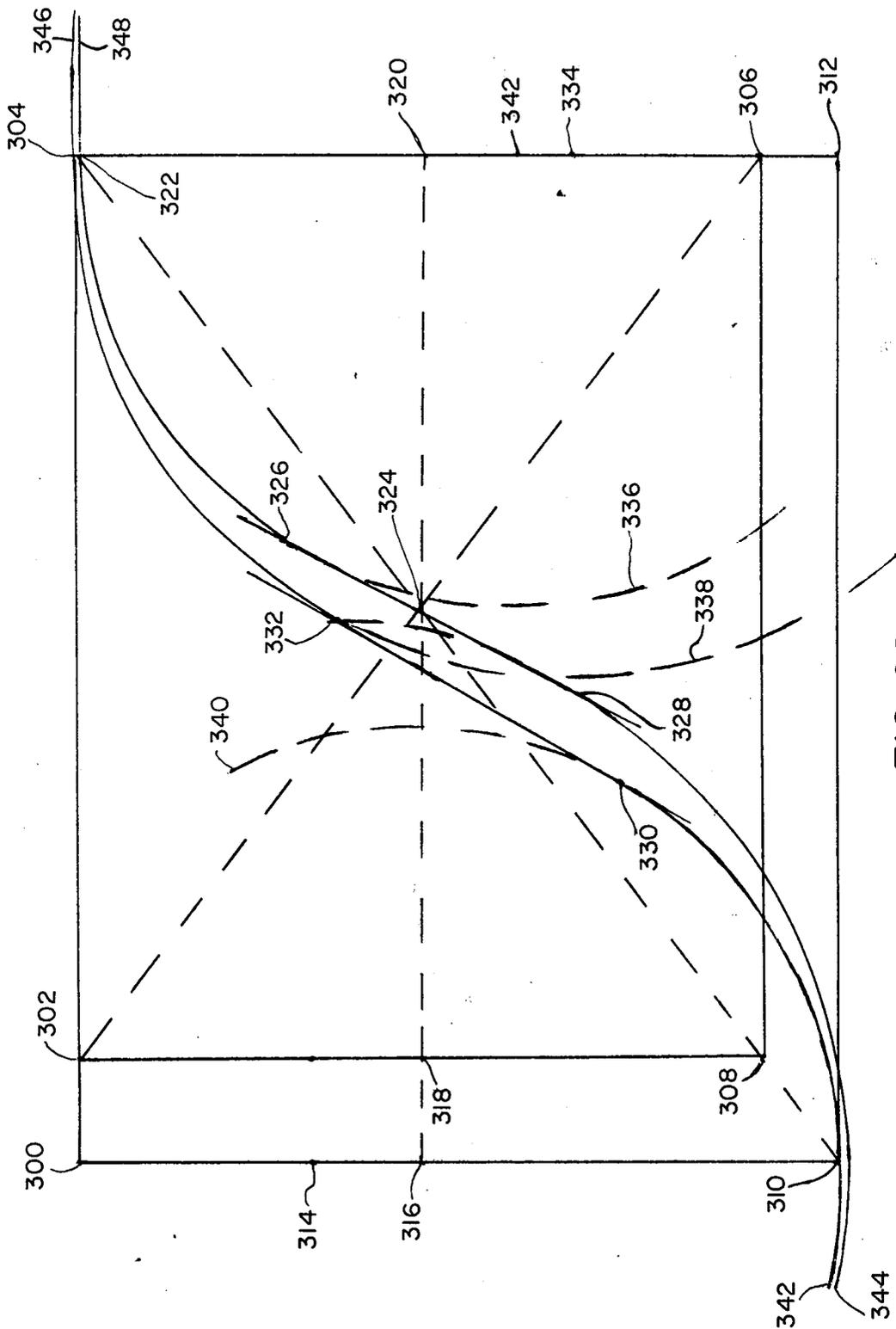


FIG. 28

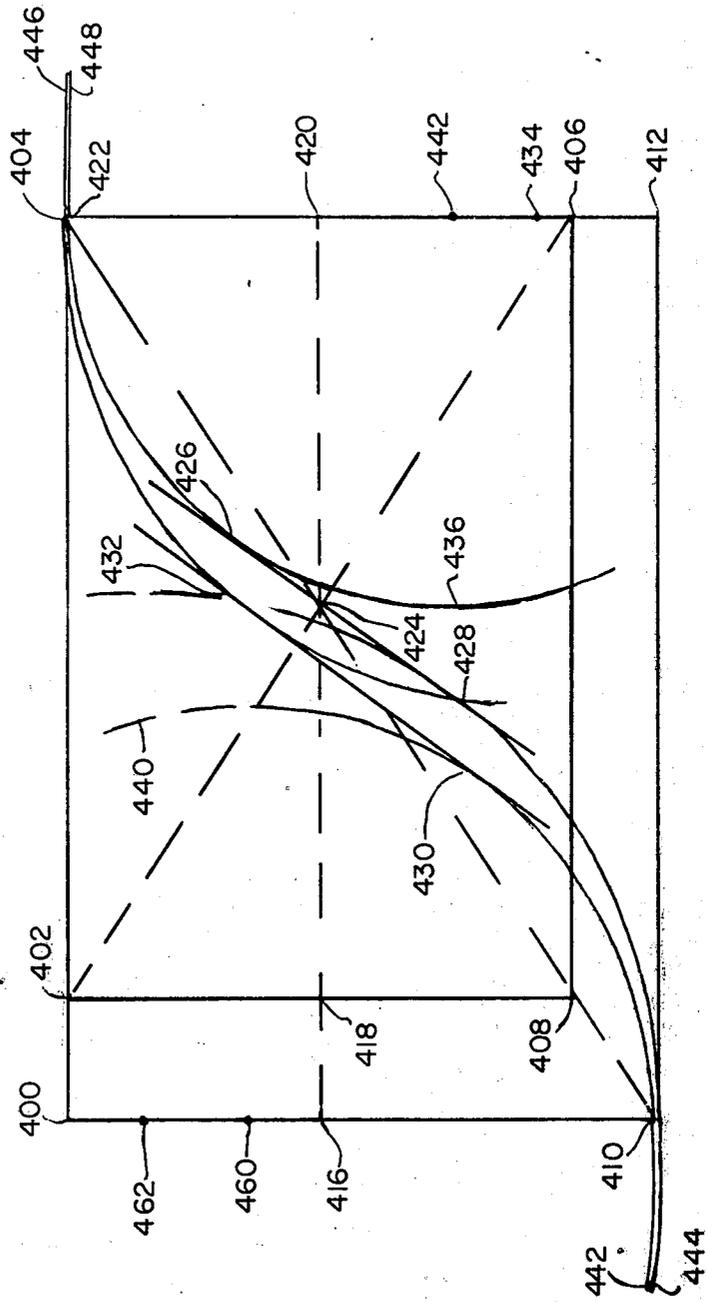


FIG. 29

APPARATUS FOR TRACING PATTERNS FOR THE GARMENT INDUSTRY

This is a continuation-in-part of application Ser. No. 131,905, filed Apr. 7, 1971 now abandoned.

The present invention relates to a garment drafting apparatus.

More particularly, the present invention relates to a garment drafting apparatus adapted to be used by one unskilled in the art, this apparatus having new and novel apertures therein.

Garment drafting apparatuses per se, are old in the art and have been used as such in the garment industry for many years. Generally, they comprise a flat board-like device having apertures within, these apertures adapted to represent the outline of the garment being drawn. These curves and/or straight lines are used to draft the outline of the major curves of a garment of any one size. The individual curves within the apparatus are correlated in such a manner so as to complete a garment of one specified size; these curves being drawn to a predetermined "norms" established by the industry. Thus, for example, the garment industry has established sizes whereby it has been found that a certain percentage of the population having a waist measurement of so many inches will also have other body measurements falling within a certain range. For each predetermined size, there may be supplied a different apparatus having curves within adapted to this key body measurement. Thus, when buying clothes, one has the choice of various sizes, each size being proportioned so as to fit the "average" person. This is the basis on which "ready-to-wear" clothes are made. While such a device is suitable for the quick drafting of those garments, it is, of course, not suitable for those whose body proportions do not fit within the norms decided by the industry. These people are thus forced to buy "made-to-measure" clothes or else adjust the ready-to-wear garments to their own measurements.

In a preferred embodiment, some of these apparatuses have been adapted so as to have measurement indicating means on the individual apertures within the apparatus; these measurement indicating means operating so one can design a garment having varied body proportions. Recently, however, there has been an increase in the popularity of garment-making in the home. While some of the proposed prior art apparatuses are suitable for use by the garment industry and one skilled in the art, there has heretofore been a lack of an apparatus suitable for garment drafting by the ordinary consumer who is unskilled in the art. More particularly, none of the prior art apparatuses are adapted for the complete drafting of a garment by one unskilled in the art; indeed most of the apparatuses proposed in the prior art require a multitude of operations and/or fittings and/or calculations in order to draft an ordinary garment.

A garment drafting apparatus suitable for use by the consumer should have within one apparatus all the apertures necessary for drafting of many types of garments, have measurement indicating means on the apertures adapted to give a garment proportioned to the individual person, and should not require fittings and/or calculations before the pattern is complete. In respect to this last point, two of the more difficult operations in the prior art proposals have related to the drafting of the sleeve curve, the sleeve curve typically hav-

ing different curvature for the front and back portions, these different curvatures preferably being drawn in one operation. The other most difficult operation in the drafting of a garment relates to the forming of darts; darts being the basic requirement for the good fit and appearance of the finished garment.

To better understand the basis of the present device, reference will be made to several prior art proposals and their methods of operation. Some of the prior art apparatuses are exemplified by U.S. Pat. No. 325,409 issued to Hendricks, U.S. Pat. No. 845,319 issued to Ricciardi, and British Pat. No. 9896 issued to Gaunt. More particularly, reference will be made to these patents regarding the specific requirements of an apparatus adapted to consumer use as discussed above.

With reference to the desirability of having an apparatus suitable for the drafting of all garments, it may be noted that in the patent issued to Ricciardi, the only reference as to the type of garment which may be drafted from such an apparatus is to a pair of pants. In his patent, Hendricks does not disclose exactly what type of garment is being designed with his apparatus, it however seeming, that his device is intended to be used for a dress pattern. Similarly, the British patent issued to Gaunt specifically states that the only suitable use for the apparatus disclosed therein is in the drafting of ladies' and children's garments. While it may be said that the use of apertures in a stencil drafting device are dictated by the type of garment for which the pattern is being drafted and are an obvious matter of choice, it must be recognized, however, that to provide a multitude of apertures would lead to an unwieldy device. Referring again to Gaunt, an apparatus suitable for designing a dress pattern is disclosed as being 26 inches wide. It would therefore be desirable to provide a stenciling apparatus having the minimum number of apertures, these apertures being adapted to perform essentially the same function as a multitude of apertures could. It is essential, of course, that the minimum number of apertures be adapted to design all types of garments such as dresses, pants, jackets, and the like.

Referring to the second point mentioned above, wherein it is desired to have a measurement indicating means on the individual apertures within the garment drafting apparatus, some of the prior art does disclose such means. For example, in Hendricks, there is provided on the apertures a means of measurement comprising marks indicating the number of inches. Ricciardi's patent, however, does not disclose such a measurement indicating means and would clearly be unsuitable for one unskilled in the art. Indeed, Ricciardi discloses in his patent that the details of the garment drafting system would not be comprehensible to one unskilled in the art. The patent to Gaunt also has a provision for measurement indicating means, these measurement indicating means generally being similar to those of Hendricks in that they generally indicate inches in a direct measurement from the body.

Having reference to the drafting of a sleeve curve, this drafting has up until the present required a plurality of operations; even with these operations, a sleeve curve having a different curvature for the front and back portion as it preferred, has not been disclosed. Referring to Gaunt, there is disclosed on page 6, line 34 et seq, a method of drawing a sleeve pattern which is further illustrated in FIG. 5 of the drawings. It will be seen from the above disclosure by Gaunt that a plural-

ity of draft lines, in many operations, etc. are needed to provide for the sleeve curve. It may be furthermore noted that using the method of Gaunt, it is impossible to provide for both the front and back portions of the sleeve curve in the same operation. Furthermore, in Gaunt, there is provided the choice of only three configurations of the sleeve curves depending upon whether the person is an adult, girl, or child.

As mentioned above, the formation of the darts of a garment is one of the most difficult operations in pattern drafting and has heretofore required a multitude of steps and/or fittings and/or calculations. When the formation of a dart has been mentioned in prior art proposals, it has usually involved the formation of a basic dart and subsequent calculations and transfers thereof. This is very disadvantageous as darts are basic in the drafting and formation of garments; upon these depend the basic fit and look of the finished product. More specifically, referring to the above-mentioned patent to Gaunt, there is disclosed on page 4, line 12, et seq, a method for marking off the relative widths of the two darts requiring the use of a dart calculator to be used in cooperation with the left and right one-third scale having a central divisional point between them, and left or right one-third scale having a similar divisional point between them, and left or right one-third scale having a similar central division. This dart calculator consists of a column of numerals representing the various measurements the darts are required to take up, reference to these calculators being absolutely necessary. There is furthermore disclosed on page 6, lines 1 et seq, that when French darts or darts of unequal size are used, the first and second French dart scales must be used in combination with a French dart calculator in place of the above described system. Furthermore, it is required to use the apparatus to get the height of the dart. Even further, as disclosed by Gaunt, it is necessary to first of all obtain the basic dart. Having reference to FIGS. 1 and 2 of Gaunt, it will be noted that there are required three separate dart calculator scales, these to be used in conjunction with six dart scales along one edge of the apparatus, and three dart points along another edge. Furthermore, it is required in Gaunt to have these two triangles to form the darts. Even further, in FIG. 4 of this reference, it will be noted that there is no provision for the drawing of the bust side dart which is basic to most feminine garments. Extensive reference has been made to Gaunt, it being felt that this is one of the most complete prior art drafting apparatuses.

It is believed that with the present invention, applicant has designed a garment drafting apparatus which overcomes all the disadvantages of prior art proposals.

It is an object of the present invention to provide for a garment drafting apparatus, this apparatus having means for designing all types of garments, this apparatus being of a manageable size.

It is a further object of the present invention to provide for a garment drafting apparatus, this garment drafting apparatus having measurement indicating means whereby the garment being designed may be adapted to the body proportions of the user.

A still further object of the present invention is the provision of a garment drafting apparatus having means for the drafting of a sleeve curve, this sleeve curve having different front and back curvatures, the means for the drafting of the sleeve curve being done in one operation.

A still further object of the present invention is the provision of a garment drafting apparatus having dart forming means therein, this dart forming means eliminating the need for forming of a basic dart; this dart forming means also eliminating the need for calculations and/or fittings.

Generally, the garment drafting apparatus according to the invention is preferably a board of a quadrilateral shape, and comprises a plurality of apertures within said board, said apertures being adapted for the drafting of the outlines of a garment. The apertures also have along their edges key figures at predetermined points, these key figures being correlated by means of a table to the actual measurements of the human body. These key figures thus form the measurement indicating means on the individual apertures. The table according to the present invention, correlates the actual measurements taken from the human body to a specific key figure as will be discussed in greater detail hereinafter. The contour portion of the apertures are sequentially transferred onto a cloth drafting material with a predetermined relationship so as to obtain the desired contour of the desired garment.

The apparatuses of the present invention leads to the basically automated method of designing garments with maximum efficiency and economy of material. The apparatus eliminates prior adjusting steps usually needed before completing a garment such as a blouse, dress, coat, pants, and other garment components. The apparatus is particularly suitable for use by those unskilled in the art; it also being adaptable for use on an industrial scale. It has also been found that the apparatus of the present invention may be used to alter patterns bought in a predetermined size so as to fit the individual person. With this apparatus, the elimination of all the mental acts required in prior art is eliminated and a complete garment may be drafted without necessitating the use of fittings and/or adjustments and/or calculations.

Further objects and advantages of the present invention will become obvious when the accompanying disclosure is read in conjunction with the drawings in which:

FIG. 1 is a plan view of one-quarter of one side of an apparatus of the present invention;

FIG. 1A is a plan view of a second-quarter of the side shown in FIG. 1;

FIG. 1B is a plan view of a third-quarter of the side shown in FIG. 1;

FIG. 1C is a plan view of a fourth-quarter of the side shown in FIG. 1;

FIG. 2 is a plan view of the opposite side of the apparatus shown in FIG. 1;

FIG. 2A is a plan view of the opposite side of the apparatus shown in FIG. 1A;

FIG. 2B is a plan view of the opposite side of the apparatus shown in FIG. 1B;

FIG. 2C is a plan view of the opposite side of the apparatus shown in FIG. 1C;

FIGS. 3 to 13 show the sequence of the method of making the front of a bodice of a garment;

FIGS. 14 to 19 and 24 to 27 show the sequence of the method of making sleeves;

FIGS. 20 to 23 show the sequence of the method for making pants;

FIG. 28 is an enlarged view of the larger aperture used for drafting the sleeve curve and the method of derivation of the aperture; and

FIG. 29 is an enlarged view of the smaller aperture used for drafting the sleeve curve and the method of derivation of the aperture.

In the drawings, reference will be made to the apparatus and method using the apparatus wherein the measurements of the steps are transferred directly onto the material forming the garment, or alternately, onto tracing material from which the resulting pattern may be applied or transferred to the garment material. In this respect, for simplicity, the garment or tracing material is not illustrated per se in the drawings — it being understood that the marking lines illustrated, outlining the patterns, will be on such material in actual practice of the present invention. Still further, for simplicity and ease in understanding the present invention, the marking lines and resulting patterns formed by the marking lines are shown in certain figures as being superimposed on the apparatus of the present invention, whereas in normal practice of the present invention, such marking lines applied to the garment or tracing material are beneath the device which is normally superimposed on such material. In the subsequent description, reference will be made to a substrate surface denoting the tracing, garment or the like material onto which the lines are marked.

The front of the apparatus of the present invention is shown in FIGS. 1 and 1A, these two halves being of a one piece unit. Similarly, FIGS. 2 and 2A show the back side of the apparatus of FIGS. 1 and 1A. The preferably quadrilaterally shaped board is indicated generally by reference numeral 10, and made of any suitable material — e.g. paperboard, plastic, metal (e.g. aluminum, etc.) or the like. A most preferred shape of the device is a rectangular shape; however, the geometrical configuration may vary as will be appreciated by those skilled in this art upon reading this disclosure. For storage purposes, the device or board 10 is preferably foldable along the axis X-X'.

In the device of the present invention illustrated in the drawings, both sides of the board 10 are utilized for the sake of simplicity, since several of the cut-outs or apertures can represent on the respective sides of the device, the front and back configurations of the body, appropriate scales being used with the respective sides to indicate the front and back, as explained hereinafter. However, if desired, rather than utilizing the appropriate reverse configurations of a given cut-out of the device on a given side thereof, the cut-out may be repeated in the device on the said given side by making the device longer in width and/or length and using appropriate indicia.

The board 10 is provided with various scales hereinafter identified, representing linear measurements of various components of the human body. For the sake of simplicity, the above-mentioned scales, which are linear scales, are positioned about the periphery of the board 10 (hence the preferred rectangular shape), and in effect, each of such scales includes a cut-out permitting marking of a substrate surface — the cut-out being the free edge of the board 10. For the sake of compactness, where it is not possible to incorporate such linear scales along the periphery of the board, the appropriate cut-out is made in the board and the scale located inter-

riorly of the side margins as will be evident from the accompanying drawings.

The scales included in the device of the present invention include scale A representing the front armhole depth; scale A' representing the rear armhole depth; scale B representing one-half of the diameter of the neck; scale E representing one-quarter of the front bustline; scale E' representing one-quarter of the rear or back bustline; scale G representing one-quarter of the front waist; scale B' representing one-quarter of the rear waist; scale H representing one-quarter of the front hip measurement; scale H' representing one-quarter of the rear or back hip measurement; scale I representing one-half of the breast distance (used for women's garments only); scale J representing the complete breast height; scale C representing the total front length of the shoulder; scale C' representing the total rear or back length of the shoulder; scale 1 representing the complete armhole depth for sleeves of a first type of construction, for all types of garments; scale 2 representing one-half the sleeve width; scale 3 representing one-quarter the sleeve width for different types of garments; scale 4 representing one-third the armhole depth for garments of a different type of sleeve construction; scale 6 representing the complete crotch length; scale 7 representing one-quarter the hip length for pants and the like; scale 8 representing a scale for the positioning of pleats for pants or the like; and scale 9 representing the complete length of the front crotch edge. The device includes an optional indicia scale K indicating the equivalent between metric and English length measurements.

The board is also provided with a plurality of cut-outs or apertures for defining other measurements of a piece of a garment. The use of the apertures in the apparatus of the present invention will be described hereinafter in greater detail. Thus, there is provided an aperture generally designated by reference numeral D, which is adapted to be used for designing the neckline of a garment. A substantially boomerang shaped cut-out F having curved sides is used to define the front contour of the armhole. This aperture F may also be used to define the crotch curve for trousers, shorts, or the like. A linear aperture associated with scale C is employed in the present apparatus for the drafting of the length of the shoulder of a garment. Similarly, the aperture generally designated by G and H has the dual purpose of operating to draft the waist and hips of the garment. A further aperture generally designated by W is used for the drafting of the dart curves. Aperture I, is used in the drafting of the breast distance. Still further, aperture J is adapted for the drafting of the breast height of a garment. The illustrated apertures are especially designed so as to obtain a curve and/or straight line by one stroke of a marking device — e.g. a pen.

In accordance with this invention, there are provided two novel apertures within the apparatus adapted to draft the front and back portion of a sleeve curve. These apertures are of a general S-shaped nature as are indicated by reference numerals 5 and 5A. The smaller of the S-shaped apertures — 5A, is adapted to draft the sleeve curve for a smaller sized garment (i.e. the sizes which may generally be represented as running from 2 to 14). The larger of the S-shaped apertures — 5, is employed in the drafting of a sleeve curve of a garment having sizes generally ranging from 38 to 54. Both of these S-shaped apertures of the present apparatus are

adapted so that one edge of the S-shaped aperture is adapted to operate in conjunction with the other edge to give the complete sleeve curve in one operation. This will become obvious with the following disclosure wherein the construction and use of these novel S-shaped apertures is discussed.

It will be seen that the two generally S-shaped edges of the apertures 5 and 5A comprise intermediate first and second generally straight lines each of which is joined to first and second arcs of first and second circle curves of different radii, which straight lines are, in generally opposed generally parallel relation, and wherein the straight line portions are tangent to the first and second arcs of the first and second circle curves. This in use parallel relationship of the straight line portions of the S-shaped edges of the apertures 5 will best be appreciated from a consideration of FIG. 28 and specifically the lines generated between points 326-328 and 330-332.

Furthermore, in accordance with this invention, a novel aperture is provided, this novel aperture supplying the means for the forming of the darts of a garment not having the inherent disadvantages of prior art apparatus wherein the basic dart had to be formed. This dart aperture W has the general configuration of a quarter segment of a circle and operates in conjunction with a further cut-out generally designated by reference P, having the general configuration of a right-angled triangle with the base of the right angled triangle being in common with one of the straight lines defining the quarter segment of the circle. Indicating means 11 are provided on the art of dart aperture W.

The above cut-outs, except for the ones for the darts, are provided on their edges with a scale similar to the scales described with respect to A, A', etc. The scales for A, A', etc. and the cut-out or apertures above-described, are in terms of a "key" figure. Thus, all of the scales of the cut-outs in terms of those inwardly spaced from the margins of the board, and of those on the margins of the board, contain the same key numbers. In this respect, the device further includes a table N containing the key numbers. The table N supplies a key figure for each true measurement of the mannequin or the person to be clothed. From this key figure, it is possible to identify a length from one of the scales along a corresponding cut-out or side of the board. Thus, knowing previously the exact measurements for a pattern while drawing and permitting the scales to act individually and separately as well as in proportion to a relative size, there will be obtained the correct size of the desired pattern, eliminating all adjusting steps conventionally required in prior art methods.

In other words, with the device of the present invention, it is possible to attain a perfectly designed and fitted garment even for those whose body proportions do not fall within the established normal ranges. There is thus provided a plurality of apertures, each of these apertures having a measurement indicating means, each of these measurement indicating means allowing each individual component of the garment to be drafted according to the actual body measurement of the end user.

In a preferred embodiment, the cut-out F includes a pair of scales indicated generally by reference numerals 100 and 102 on the long curve of the cut-out, which long curve is used for the front of the armhole; while the shorter curve is used for the back. Only one side of

the board need be used for cut-out F if desired, but both sides may likewise be employed as explained hereinafter.

In constructing the board, where the cut-outs or linear sides of the board function as cut-outs, preferably all of the cut-outs are so arranged that those applying to the "front" of a garment are on one side and those applying to the "back" or rear of a garment are on the other side.

STEPS FOR USING THE BOARD FOR DESIGNING THE FRONT BUST OF A GARMENT:

A key number is located on the table N which corresponds to the bust circumference. For example, if the circumference of the bust is approximately $37\frac{1}{8}$ inches, the key figure is 44. For the purpose of simplifying the following explanations, the other dimensions of the mannequin will be taken as corresponding to the same key figure 44, but as explained above, the appropriate key figure for each type of measurement will be selected from the table N. The board 10 is placed with the front bust scales face up as in FIG. 1. Initially, the measurement of the length of the front bust of a person (from the highest point of the shoulder to the waistline) is determined and, a vertical line 104 is drawn on the substrate corresponding to this length, the initial and terminal points of this line being designated O-k (as shown in FIG. 4). Subsequently, the left-hand side of the board 10 is aligned with line 104, the top left hand corner of the board being at the point O. Without moving the board 10 at the numeral 44 on scales A, B and C, the substrate is marked with dots a, b and c in front of the respective numerals 44. The inclination and the length of the shoulder will then be represented by a line drawn from points b to c forming a line 106 (see FIG. 4).

In order to define the neckline, the initial point of the scale D is moved over the point b and the board 10 is rotated until the numeral 44 of the scale D meets the vertical line O-k at d (FIG. 5). The curve line 108 between b-d represents the neckline as illustrated in FIG. 6.

With the scale E and from a point a' (FIG. 6) which corresponds to the armhole depth, a horizontal line 110 between point a'-e is drafted, the point e corresponding to the number 44 on the scale E (FIG. 6). The line 110 is perpendicular to the line 104 and corresponds to one-quarter of the circumference of the bust. For male and child patterns, the point 44 of the bust scale 102 of cut-out F (as shown in FIG. 8) is placed over the point e and the board is rotated so that the point c meets the contour of the cut-out F. The armhole curve can now be drafted by drawing a curved line 112 between the points c and e. For women, where a different body symmetry than that of a male applies, use is made of the second scale 100 of cut-out F where the key number 44 is located, and from the point e on the bust line a-e, a vertical line 114 is drawn (whose length is not critical). Subsequently, the key numeral 44 of the second scale 100 is placed at a point c and the board 10 is moved until the reference numeral 44 of the first scale 102 intersects line 114 at e'. Thereafter, a curved line 112' containing the contours of the cut-out F is drawn between the points c and e', thereby defining the definitive female armhole curve. This is in contrast to prior art techniques in which a plurality of adjustments were required to obtain such a definitive curve.

The board is thereafter positioned in its normal orientation so that the vertical line **104** coincides with the left end edge of the board and so that a horizontal line **118** from points *k* and *g* perpendicular with the vertical line **104** is drawn. The length of line **118** is determined from the scale **G** and corresponds to one-quarter of the circumference of the waist (FIG. 9).

On the horizontal line **118**, the point *i* is located according to scale **I** to determine the breast distance according to key numeral **44** marked on the substrate. From the point *i* a vertical line **120** is drawn which is parallel to the line **104** until it meets the line **110** at the point *y*. The vertical line **120** determines:

- 1 — the distance of the breast from the line *O-k*;
- 2 — the center *i* of the darts for the waist (FIG. 13).

The initial point of the scale **J** is positioned on the point **B** and number **44** of the scale **J** is brought to meet the vertical line **120** so as to determine exactly the breast point *j* for the pattern (FIG. 11), this point *j* being the uniquely determined breast point which in turn is the focal point to which all darts of the bodice point to.

Although the basic garment has now been described as above, if such a garment were to be worn by a person, it would be ill-fitting. In systems using garment drafting devices of the prior art, it would not be necessary to consult tables and take measurements to determine the height and width of the darts. What has often been provided for in the past is the cutting out and sewing of the garment leaving the darts to be adjusted at a final fitting. With the device of the present invention, there is provided a dart drafting aperture which is adapted to form the side bust dart, this side bust dart being essential for all female garments.

In order to determine a dart, the following example is typical of that which may be used, the other darts being likewise drawn. In this example, reference will be made to the dart from the breast to the side, i.e. the side bust chart.

From point *j*, a line is drawn in the direction of the desired dart that is, for example, by a horizontal line **122** from point *j* to point *r* which meets the vertical line **114** from point *e*. The apex of the angle of the cut-out **W** is positioned over the point *j*, and a further line **124** is drawn therefrom to indicating means **11**. Alternatively the apex of right angled triangle **P** may be placed on point *j* and the sides of the cut-out employed to draw lines **122** and **124**. The desired dart will be obtained by the width between the points *r* and *r'* which depends on the length of the lines **122** and **124** (FIG. 12).

There is thus drawn a complete garment pattern which has not necessitated use of complicated arithmetic calculations, fittings, or any free-hand drafting. Furthermore, as will be described hereinafter, the formation of the side bust dart as described above, allows the formation of other optional darts not necessitating calculation.

The point *r'* is joined by a line **126** to point *g* (FIG. 13) in order to complete the desired pattern of the front bust of the garment such as a blouse.

By following the above-described procedures, but by employing the previously described cut-outs and scales for the back or rear of a garment, and by again drawing the same lines, the back portion of the garment may be drafted. In this respect, use is also made of a further scale indicated by reference numeral **105** (see FIG. 2) for the purpose of determining the neckline depth. Use

is made of scale **105** in place of the above-described procedure with respect to scale **D** in drawing reference line **104**. In this case, the appropriate key figure is selected on scale **105** with the device of the present invention being in the form shown in FIG. 2; the appropriate key figure is further selected from scale **B** and likewise marked on the substrate; thereafter, the neckline curve of cut-out **D** is then positioned between the points denoted by the key figures of scale **B** and scale **105** and a line preferably a perpendicular line extending from the key figure on scale **105** (perpendicular to the length of the corresponding line **104** for the back of the pattern) is drawn and, the portion of the cut-out **D** is then lined up with the straight line, and the curve then drawn between the respective points to form the back line corresponding to line **104** described above. This added step is desirable since the back neckline curve differs slightly from the front neckline curve in the human figure.

Finally, if it is desired to form a dart for the waist, point *i* represents the center of the dart and the apex of the dart is at about 2 cm below the point *j* (FIG. 13) this *j* being the uniquely determined apex of the side bust dart.

From the measurement of the circumference of the arm the corresponding key figure is located in the table **N**. The length of the sleeve is also measured.

The board **10** is used in a position so as to normally read the word "SLEEVES" thereon and so that the scale **1** is on the right-hand side of the board. The edge of the board is used as a straight "ruler" and a vertical line **202** is drawn co-responding to the length of the sleeves, the initial and terminal points of the line **202** being indicated by *O'* and *X''*. The board is positioned at this point so that the top righthand corner meets point *O'*, the right-hand margin of the board **10** being along the line **202**. Thereafter, from scale **1**, the key numeral **44** is located and marked with point *1'* which determines the sleeve armhole depth (FIG. 14). The board **10** is moved along the axis **202** until the scale **2** meets the point *1'* on the line **202**. A line **204** is drawn along the scale **2** from point *1'* to point *2'*, that is, to the number **44** of scale **2**. This determines half the width of the sleeve (FIG. 15).

The cut-outs **5** for determining the sleeve curves are then used by superimposing number **44** of the appropriate cut-out **5** with the point *0'* of the line **202**. The board **10** is rotated until the point *2'* of the sleeve width meets the curve of the cut-out **5** (FIG. 16). The sleeve curve is then drawn by a line **206** along the contour of the cut-out **5**. In FIGS. 16 and 17, the board **10** has been shown slightly displaced from the curved line **206** drawn through the cut-out **5**, for the sake of clarity. The back of the sleeve curve is determined in the same manner by using the appropriate curve which back sleeve curve is indicated by reference line **206'** (FIG. 17). In this respect, as will be seen from the drawings, the upper curve of each cut-out is used for the front sleeve curve and the lower curve of the cut-out **5** for the back sleeve curve, both of which are used in the above-described manner.

In the next step, from the point *X''*, a horizontal line indicated by reference numeral **208** is drawn extending to the left (when viewed from FIG. 18) equal to half of the desired width of the lower edge of a sleeve. The precise measurement will vary depending on the type of sleeve desired - in the case of a tight sleeve, the mea-

surement will be of course less than that where a "loose" sleeve is desired. For example, in an average sleeve construction, the length of the line 208 may be approximately 11 cm. Subsequently, and depending on the style of sleeve desired, a line joining point 2' and the terminal point of line 208, indicated by X''', is drawn (designated by reference numeral 310 in the drawings). However, as shown in FIG. 18, for most conventional types of sleeve, the line 210 is stopped short of line 208 to provide an inward taper of the sleeve. In this case, the line 210 ends at point X'''. This provides the desired curvature to the sleeve; thereafter, the actual desired line on the garment indicated by reference numeral 212 is drawn in this alternate arrangement.

In order to obtain the full sleeve, the substrate on which the pattern of FIG. 18 has been designed is folded along its longitudinal axis and along the line 202, whereafter the pattern is cut out with appropriate means (e.g. scissors) along the lines 210, 212 and 206. The substrate is then opened up and the substrate then cut along line 206' to yield the outline of the pattern illustrated in FIG. 19 for an entire sleeve.

STEPS FOR DESIGNING PANTS:

Referring now to FIGS. 20 - 23, the initial step involves locating the device 10 in the position shown in FIG. 20 (that is with the word "PANTS" thereon so as to be legible in the proper upright position); thereafter, the key FIG. 44 is selected from scale 6 and the point 6' marked opposite the key figure on the substrate. Thereafter, a line 220 is drawn between the upper right-hand corner of the board, the initial point of the line being indicated by reference letter O'' and the resulting line between points O''-6' being indicated by reference numeral 220 and indicating the crotch length. While maintaining the device 10 in this position, the appropriate key figure is selected on scales 7 and 8, and the substrate marked with points 7' and 8' respectively. These points designate the length of one-quarter of the hip, and the pleat position for the pants.

In the subsequent step, a horizontal line is drawn from point O'' extending towards the left (as viewed in FIG. 21), which line is indicated by reference numeral 222.

Subsequently, the device 10 is then lowered until scale 9 meets the terminal point 6' and from this point a further horizontal line indicated by reference numeral 224, is drawn until it meets a point 4', which designates the key figure from scale 9, the length of line 224 between points 4' and 6' determining the crotch edge length. Whereafter, the definitive length of line 222 is defined by the point 7' (described above) and in one embodiment a rectangular outline is drawn by extending a line perpendicular to the defined length of line 222 through point 7', to meet line 224, which resulting line is indicated by reference numeral 226; the initial and terminal positions of line 226 being designated by reference letters W and Z.

Thereafter, a perpendicular line indicated by reference numeral 230 is drawn to line 222, passing through point 8' and intersecting line 224 at y'. The length of line 230 corresponds to the desired pant length, which figure will vary depending on the person for whom the garment is being made, as well as the style. In a subsequent step, one-half of the length of the line 230 between the points y' and 8'' is determined, and is indicated by reference numeral 232 on the drawings (see

FIG. 22). The 8'' designates the extreme pants width. As is known by those skilled in the art, the knee position is slightly above one-half of the length and for this purpose, a point above the mid-point 232 is normally taken. This point, indicated by reference letter M'' is generally between 2-8 cm above point 232 (for adults - generally in the order of 5 cm; while for children 1 - 3 cm is the normal position).

For the front of the pants, initially the device 10 is positioned so that scale G is positioned whereby the lefthand side of the board (in the form shown in FIG. 9) is aligned with line 226, and line 222 is visible through the cutout associated with scale G. Thereafter, a point g is marked opposite the appropriate key figure of scale G. A point t' ranging from 2 to 4 cm may instead be chosen to provide for a pants dart for better fitting if desired. Subsequently, for a well fitting garment, a point one-half cm in from point 6' on line 224 is marked, as indicated by reference numeral 236 and with the use of the dart curves P, a line extending between points t' and 236 is drawn, which line is indicated by reference numeral 238. Desirably, when drawing line 238, it is maintained within the rectangular configuration defined by lines 220, 222 and 224 - i.e. so that at its maximum point indicated by reference numeral 6'' (FIG. 23) it extends only to the border of line 220. If desired, for a better fitting, a greater distance than the line 226 may be chosen.

Subsequently, the distance between points 4' and Z is determined (from FIG. 22) to yield a given measurement, which point is then transposed and marked on line 226 and is indicated in FIG. 23 by reference letter R. Subsequently, with use of the crotch curve of cut-out F, a line 240 is used to join the points R and 4'. In this respect, when reference is made to the "crotch curve" above, it is meant that use may be made of the armhole curve of cut-out F.

In a subsequent step, from point M'', a line perpendicular to line 230 and parallel to lines 222 and 224 is drawn as indicated by reference numeral 242. The length of this line is not critical. Thereafter, the width of the cuff of the pants (a width which depends on the style and personal taste) is determined, and a further line 244 is drawn through point 8'', which line 244 is parallel to line 242 and perpendicular to line 230. Generally the line 244 is equi-spaced on either side of point 8'', terminating in points 246 and 248; however, one side of line 244 may be longer than the other if desired. Thereafter, a line is drawn joining points 236 and 248 thereby forming line 250. To form the curve crotch of the inside seam of the leg of the pants, from point 4' a point 252 along line 224 is selected, which point 252 will be determined by preference for fitting purposes. It has been found that within the range of 1 to 4 cm, preferably about 2 cm, a particularly well fitting garment can be obtained with the required inclination for the inner seam of the leg. Thereafter, a straight line is drawn between points 252 and 246, as indicated by reference numeral 254. From point 252, along line 254, a further predetermined distance is selected as indicated by reference numeral 256, which distance is preferably between about 6 to 12 cm, desirably around 7 cm (for all garments) and with the use of the curve of cut-out P, the point 4' is joined to the point 256 to provide a continuation of line 254 extending to point 4', along which the garment is cut out.

In forming lines 250 and 254, the points of intersection with line 242 is indicated by reference letters M' and N''. These points are used to determine the knee areas which are joined together at the front and the back when the garment is being sewn together.

The above-described steps provide the front of a pants garment.

To prepare the back of the pants, substantially the same steps, in the above-described sequence, are employed; however, in this case in drawing line 222, a distance between 3 - 5 cm, desirably around 4 cm, is taken inwardly from the point W on line 222, and a line is drawn between point Z and the distance inwardly on line 222. In this manner, line 226 is eliminated. Thereafter, the line replacing line 226 is extended between 3 and 5 cm, desirably about 4 cm, above line 222 on the same angle of the line extending between points Z and the inwardly spaced point on line 222; at the terminal point of the extension, a line is drawn between a point spaced approximately 1 cm from point t (to the right as shown in FIG. 23) and the terminal point of the extended line above line 222, thereby forming the inclination of the waist line for the back. Thus, the inclined line above-described replaces line 222 for the pattern for the back of the pants.

To determine the crotch edge for the back of the pants, the distance between points Z and 4' is used to form an extension of line 224 from point 4'; for a well fitting garment, an additional 1-3 cm can be added, desirably around 2 cm to the said extended line 224. Thereafter, approximately one-half of the line replacing line 226 is determined. Still further, for a proper adjustment, a point approximately 1 cm to 3 cm below the terminal point of the extended line 224 is marked and using the crotch curve of cut-out F, a curved line (replacing line 240) is drawn between said half-way point on the line replacing line 226, passing through point 4' and terminating in the point located approximately 1½ cm below point 4'.

Apart from the above two described steps, the other steps described for the front of the pants garment are likewise employed with excess material usually used for the back of the pants.

STEPS FOR DESIGNING ALTERNATE SLEEVES:

Referring now to FIGS. 24 to 27, there is illustrated alternate methods of obtaining different types of sleeves.

Referring initially to FIG. 24, the basic skeleton of a sleeve is formed as follows. The board 10 is placed over the substrate surface so as to normally read the word "SLEEVES" thereon (as is described above with respect to 14).

A vertical line is drawn corresponding to the length of the desired sleeve, which length is determined from the person for which the garment is intended. This line indicated by reference numeral 270 has initial and terminal points 20 and 21 respectively. Thus, the device 10 is aligned with the righthand side along the line 270, the upper right-hand corner of the device being at the point 20. Thereafter, with the board thus oriented, the appropriate key number is selected from scales 1, 2, 3 and 4 and marked on the substrate as indicated by reference numerals 1', 2', 3' and 4' respectively (see FIG. 24). In this respect, point 1' represents the total armhole depth; point 2' one-half the sleeve width; point 3' one-quarter the sleeve width; and point 4' one-third the armhole depth. Utilizing these points as reference

points, a rectangular pattern is then completed by forming a line 272 between points 2' and 20, a line 274 parallel to line 272 and equal in length thereto, terminating at a point 27; and a line 276 between points 2' and 27. Thereafter, a further rectangular pattern is completed by drawing a line 278 parallel and equal to lines 272 and 274, from point 21 and which terminates at point 22; line 276 is extended down to point 22. A further parallel line 280 is drawn from point 4' to meet line 276 at point 26. Subsequently, thereafter, a vertical line 282 is drawn between lines 278 and 272, passing through point 3'. The initial and terminal points of line 282 are indicated by reference numerals 24 and 25. Subsequently, preferably about one-half the distance between points 2' and 24 (or by the points 22 and 25) is determined and marked by point 29, and a vertical line 284 is drawn from point 29 to meet line 274 at point 28. the distance of line 284 from point 22 may vary according to the desired design of the style of the sleeve; the line 284 determining the seam position. As the next step, one-half the distance between points 1' and 21 is determined, and which mid-point is designated by reference numeral 30. Thereafter, a line 286 parallel to line 278 is drawn to meet line 276 at point 31. In this manner, the basic skeleton is thus provided for a sleeve pattern.

Subsequently, the board 10 is positioned in a manner shown in FIG. 25 and utilizing the front curve of the appropriate cut-out 5, the appropriate key number of the cut-out 5 is placed at the point 4', and a line 288 is drawn between point 4' and point 24 following the front curve of the cut-out 5.

In order to provide for a good tailored fit, at this point a distance approximately 2-4 cm, desirably about 3 cm, is located inwardly from point 26 on line 280, indicated by reference numeral 290 in FIG. 26. From point 27 on line 276, a point extending upwardly from point 27 and equal to approximately the same length of point 290 from point 26 is determined and indicated by reference numeral 26'. Thereafter, the board 10 is positioned in the manner shown in FIG. 26 and utilizing the back curve of the appropriate cut-out 5, a line 292 is drawn to pass through points 26' 290 and terminating at point 24 on line 272.

Subsequently, a distance of approximately 1 cm (such distance may be between about 0-2 cm) is located on line 282 above the point of intersection with line 274 and determined by point 298. Thereafter, a line 294 is drawn between points 4' and 28, passing by 298, the point located on line 282 above its intersection with line 274, using the back curve of the appropriate cut-out 5. Finally, a line 296 is drawn between points 26' and 28 with any curve of a cut-out 5. There is thus formed an armhole pattern bounded by lines 294, 296, 292 and 288 (as shown in FIG. 27). This type of pattern may be used in any desired garment, it is particularly suitable for use in coats, suits, jackets, dressing gowns and the like.

In a preferred embodiment of the present invention, there are provided two generally S-shaped apertures adapted to draft the sleeve curve of a garment, one of the S-shaped apertures being adapted to draft the sleeve curves of garments in the size range 38 to 54 inclusive, and a smaller S-shaped curve adapted to draft the sleeve curves of garments ranging from sizes 2 to 14 inclusive. It is a preferred embodiment of the present invention that the aperture for drafting the sleeve curve

of a garment have two edges both being of a general S-shape, these two edges being provided within the one aperture.

Having reference to FIG. 28, there is shown the generally S-shaped aperture of the present invention which is adapted to draft the large sleeve curves. There is also shown the methods by which this sleeve curve is drawn. Thus, there is provided for a rectangle 302-304-306-308 in which 302-304 equals 308-306, both of these equalling one-half of the circumference of the arm plus 3 centimeters for ease. Line 302-308 equals line 304-306 both of these equalling one-half of the arm-hole depth. In drawing the rectangle 302-304-306-308, the measurements used are those of a standard size 44 as determined by the table N of the present invention. A further rectangle 300-304-312-310 is then drawn in a similar manner to the rectangle 302-304-306-308, the difference being that the latter rectangle is drawn to a size 48 measurement.

After having constructed the basic rectangles, diagonals 302-306 are drawn, and a further diagonal 304-308-310 is drawn, these two diagonals intersecting at point 324 which is the center of the size 44 rectangle. There is then drawn a further line through the mid point 324, this line being parallel to the lines representing the arm circumference. This parallel line thus intersects lines 300-310, 302-308, and line 304-306 at their mid points 316, 318 and 320 respectively. Line 320-234 is then applied on line 304-306, having point 320 applied at point 304, and thus giving a new point 342 where point 324 falls. Using point 342 as a radial center, an arc of a circle curve is then drawn having a radius equal to the length of line 320-324, thus giving an arc generally designated by reference numerals 336-326-322.

Line 324-316 is then applied on line 310-300 having point 324 placed on point 310, thus point 316 giving a new point along the line 310-300 at point 314. Using point 314 as a radial center, an arc of a circle curve is then drawn having a radius equal to line 314-310 plus 2 millimeters. There is thus obtained an arc of a circle curve generally designated by reference numerals 333-328-344.

The two arcs of the circle curves 332-326-336 and 344-328-332 are then joined by a line 328-326, this line being a tangent common to both of these arcs. This tangent 328-326 will pass through the center point 324.

The arc of the circle curve 336-326-322 is then extended in a substantially straight line manner outside line 304-306. Also, the arc 332-328-344 is continued outside the rectangle. The generally S-shaped line 348-322-326-328-344 is thus obtained, this line being adapted to draft the back portion of a sleeve curve.

A further S-shaped line is then drawn in the following manner, this line being adapted to draft the front portion of a sleeve curve. First, a further point 334 is provided, this point 334 being spaced from point 342 at a distance of approximately 10 millimeters. Using point 334 as a radial center, a further arc of a circle curve having a radius 334-304 is drawn, this arc being generally represented by 338-332-304. Using point 316 as a radial center, another arc of a circle curve is drawn having radius 318-224 plus 18 millimeters, thus giving an arc of a circle curve generally designated by reference numerals 340-330-342. In a manner similar to above, a tangent 330-332 is then drawn between circle curves 304-332-338 and 310-330-340, this tangent in-

tersecting the circle curves at point 330 and 332 respectively.

Also in a similar manner to the formation of the curve for the drafting of the back sleeve curve, the arc of the circle curve 338-332, 304 is extended outwardly in a substantially straight line to a point 346. Also, point 342 is obtained on the arc of the circle curve 310-340 in an outward manner.

Having thus obtained the two generally S-shaped edges used for drafting the front and back portions of a sleeve curve, there remains the requirement to provide for a measurement indicating means. Thus at point 304 and 322, there is provided a measurement indicating means being equal to a size 44. On the extensions 304-346 and 322-348 there are provided further measurement indicating means, these measurement indicating means ranging up to size 54. On the arcs of the circle curves spaced inwardly of lines 304-312 there are provided further indicating means ranging between sizes 38 and 42.

Referring now to FIG. 29, there is shown therein the smaller S-shaped aperture of the present invention and the method of attaining same. In FIG. 29, reference numerals similar to those used in FIG. 28 are employed, the reference numerals of FIG. 29 being distinguished by being in the 400 series.

Generally, rectangle 402-404-406-408 is drawn using a typical size 10 measurement. Rectangle 400-404-412-410 is drawn to size 14 measurements. The derivation of arc 436-426-422 and arc 428-432-404 is done by the same method as was employed for the larger S-shaped aperture in FIG. 28.

Arc 432-428-444 is drawn using point 462 as a radial center and a radius equal to 416-424 plus 4 millimeters. Similarly, the arc of the circle curve generally designated by 440-430-442 is obtained using point 460 as a radial center and a radius equal to 418-424 plus 5 millimeters. The ends of the generally S-shaped configuration thus formed are extended in a similar manner as was described with reference to FIG. 28. Thus, measurement indicating means equal to a size 12 are provided at points 404 and 422, other measurement indicating points being derived in a manner similar to that employed for the larger S-shaped aperture. Thus, there are obtained two S-shaped edges, these S-shaped edges forming an aperture adapted to draft the sleeve curve of a garment in the size range of 2 to 14.

Thus, there are obtained two S-shaped edges, these S-shaped edges forming an aperture adapted to draft the sleeve curve of a garment in the size range of 2 to 14.

In describing FIGS. 28 and 29, reference has been made therein to certain measurements. It must be recognized, however, that variations of these figures may be employed without departing from the spirit and scope of this invention. Thus, for example, in referring to FIG. 28 in the drafting thereof, reference was made to line 322-334 as being equal to line 322-342 plus a distance of 10 millimeters. It is obvious that one skilled in the art may vary such a distance to obtain substantially the same results. Thus, range of 8 to 14 millimeters would give substantially the same configuration as the present invention. Similarly, in the drafting of the other arcs of the circle curves, variations may be made therein without departing from the novelty of this invention.

Also, although this has been described with respect to one aperture having two generally S-shaped edges, it is recognized that one skilled in the art may vary this and obtain essentially the same result. Thus, for example, it would be possible to provide for two separate apertures in a spaced apart relationship, each of these apertures having one S-shaped edge to be operated in conjunction with a further aperture having a second S-shaped edge. Furthermore, it is recognized that at the opposed ends of the S-shaped aperture alterations may be made thereto, these alterations resulting in substantially the same result.

It may be realized that the above disclosed steps for drawing the head of a tailored sleeve may be made in a very precise manner and may be duplicated by any person following the prescribed steps. These curves are drafted by a precise stroke of the pen while, according to previous methods, they had to be approximately drafted by hand and usually corrected thereafter.

It is understood that a plurality of patterns of garments may be designed by changing the curve of the cut-outs according to the various desired styles. Similarly, the scales along the cut-outs or the edges of the board 10 may be modified by tailors, clothes designers or industries to suit their own purposes. This also applies to the table which provides the key figure for locating various dimensions in the various scales and cut-outs.

In the above-described embodiments, reference has been made throughout to marking lines and the like applied to a substrate by e.g. a pen. These marking lines need not be solid continuous lines but rather, may be intermittent providing an outline of the desired shape to be followed.

Various modifications to the above may be made without departing from the scope of the invention. Thus, according to one alternate embodiment, with respect to the method described above for obtaining the definitive armhole especially for feminine garments, the same results may be obtained by employing a scale of the armhole depth, starting from a predetermined point, which may be the highest point of the shoulder. This alternate embodiment can be used as an auxiliary scale to assist any other method, individually, or in conjunction with a set of scales in the shape of a square, etc.

Still further, the dart indicating cut-out providing the device of the present invention with the above-described advantageous features, does not necessarily have to include the previously described small triangular of the cut-out. The same results can be obtained without the inclusion of this. Still further, the cut-out M may include a scale for determining a range of widths of a dart for the size of a pattern, which would provide a variable for manufacturers to select variations in dart sizes to suit their own needs. Further, this component like others, may not necessarily form a complete aperture in the device of the present invention but rather, now a slot may be provided to outline the shape of the component, through which a marking device can pass to permit marking on the substrate.

Following marking of the patterns according to the present invention, the patterns may then be cut out as desired according to conventional practice to form the outline of the garment components. Thereafter, the components or individual pieces can be assembled ac-

ording to conventional methods, by sewing, stitching or the like to form an assembled garment.

It is recognized, that the use of garment drafting apparatus is not new in the art, and that the mere provision of a plurality of apertures within a garment drafting apparatus is not novel. It is, however, felt that the provision of a minimum number of apertures, having measurement indicating means thereon, these apertures adapted to be operated in conjunction with new and novel apertures, thereby lead to a desired result. The specific improvement in an apparatus suitable for garment drafting is held to be the provision of at least one generally S-shaped aperture, this S-shaped aperture being used in a desired manner so as to obtain the drafting of a sleeve curve of a garment, this sleeve curve having different curvature for the front and back portions, the drafting of said sleeve curve being done in one simple operation. Even further, it is felt that the provision of a dart-forming means within a garment drafting apparatus, said dart-forming means eliminating the plurality of calculations and/or adjustments and/or fittings taught by prior art, constitutes a new and novel improvement in an apparatus.

We claim:

1. A garment drafting apparatus suitable for drafting a garment, said garment drafting apparatus comprising a generally flat stencil board having a pair of opposed flat planar major surfaces, said flat stencil board having a plurality of stencilling apertures including a dart forming aperture therein extending between said opposed major surfaces, whereby each of said surfaces forms an aperture mirror image of the other, said stencilling apertures having along at least one side a measurement indicating means, said measurement indicating means being adapted to allow the drafting of a garment correlated to individual sizes, said garment drafting apparatus including at least first and second generally S-shaped edges for drafting the front and back portion of a sleeve curve respectively, each of said generally S-shaped edges comprising first and second generally straight line portions, and first and second arcs of first and second circle curves, said first generally straight line having measurement indicating means thereon, said first generally straight line being joined to said first arc of said first circle curve, said first arc of said first circle curve being joined to said second straight line, said second straight line being of a substantial length and joined to said second arc of said second circle curve, said second straight line being a tangent to said first and second arcs of said circle curves, said second arc of said second circle curve having a radial center on the side of said second straight line opposed to the side having the radial center of said first circle curve, each of said pair of S-shaped edges comprised of said first and second arcs and first and second straight lines having one of the arcs of a larger radius than the other arc, said pair of generally S-shaped edges cooperating such that the larger arc of said first S-shaped edge for drafting the front portion of a sleeve curve is opposed to the smaller arc of said second S-shaped edge for drafting the back portion of the sleeve

curve, the smaller arc of the first S-shaped edge being opposed to the larger arc of the second S-shaped edge, and the second straight line portions are substantially adjacent and substantially parallel through their length.

2. The garment drafting apparatus of claim 1 wherein said two generally S-shaped edges form one aperture of said garment drafting apparatus, said two S-shaped edges being joined together at opposed ends of the S, said two S-shaped edges thus forming a generally S-shaped aperture.

3. The apparatus of claim 2 wherein there are provided first and second generally S-shaped apertures, said first generally S-shaped aperture being adapted to draft the sleeve curve of a large garment, said second generally S-shaped aperture being adapted to draft the sleeve portion of a smaller garment.

4. The apparatus of claim 1 wherein there is included one aperture having a substantially boomerang shape for representing the front and back of the armhole and the crotches of pants or pant-like garments.

5. The apparatus of claim 1 wherein there is provided an aperture having one edge which is of a generally circular contour.

6. The apparatus of claim 1 wherein there is provided at least one linear aperture for defining the length of the shoulder and at least one linear measurement means on the edge of the device for defining one-half the diameter of the neck.

7. A garment drafting apparatus as defined in claim 1, said garment drafting apparatus having means for drafting a dart, said dart forming means comprising a central apex point, said central apex point being adapted to be placed on the breast point of the garment to be drafted, means for drawing first and second straight lines from said breast point, said first straight line being parallel to the waist line, said second straight line being angularly disposed with regard to said first straight line.

8. The apparatus of claim 7 wherein said dart forming means comprises an aperture, said aperture having the configuration of a quarter segment of a circle, and an indicating means on the arc of said quarter segment of a circle.

9. The apparatus of claim 8 wherein said dart forming means additionally comprises a right-angle triangle aperture, said right-angle triangle aperture adapted to operate in conjunction with said quarter segment of a circle.

10. In a garment drafting apparatus suitable for drafting a garment comprising a generally flat stencil board having a pair of opposed flat planar major surfaces the improvement wherein said garment drafting apparatus includes at least first and second generally S-shaped edges for drafting the front and back portion of a sleeve curve respectively, each of said generally S-shaped edges comprising first and second generally straight line portions, and first and second arcs of first and second circle curves, said first generally straight line having measurement indicating means thereon, said first generally straight line being joined to said first arc of said first circle curve, said first arc of said first circle curve being joined to said second straight line, said second straight line portion being of a substantial length and joined to said second arc of said second circle curve, said second straight line being a tangent to said first and second arcs of said circle curves, said second

arc of said second circle curve having a radial center on the side of said second straight line opposed to the side having the radial center of said first circle curve, each of said pair of S-shaped edges comprised of said first and second arcs and first and second straight lines having one of the arcs of a larger radius than the other arc, said pair of generally S-shaped edges cooperating such that the larger arc of said first S-shaped edge for drafting the front portion of a sleeve curve is opposed to the smaller arc of said second S-shaped edge for drafting the back portion of the sleeve curve, the smaller arc of the first S-shaped edge being opposed to the larger arc of the second S-shaped edge, and the second straight line portions are substantially adjacent and substantially parallel through their length, said garment drafting apparatus further including means for drafting a dart.

11. In a method of designing a garment in which method are included the steps of providing on a substrate surface pattern lines including pattern lines for sleeves, the improvement comprising providing a garment designing device, the device comprising a generally flat stencil board having a pair of opposed flat planar major surfaces, said flat stencil board having a plurality of stencilling apertures including a dart forming aperture therein extending between said opposed major surfaces, whereby each of said surfaces forms an aperture mirror image of the other, said stencilling apertures having along at least one side a measurement indicating means, said measurement indicating means being adapted to allow the drafting of a garment correlated to individual sizes, said garment drafting apparatus including at least first and second generally S-shaped edges for drafting the front and back portion of a sleeve curve respectively, each of said generally S-shaped edges comprising first and second generally straight line portions, and first and second arcs of first and second circle curves, said first generally straight line having measurement indicating means thereon, said first generally straight line being joined to said first arc of said first circle curve, said first arc of said first circle curve being joined to said second straight line, said second straight line being of a substantial length and joined to second arc of said second circle curve, said second straight line being a tangent to said first and second arcs of said circle curves, said second arc of said second circle curve having a radial center on the side of said second straight line opposed to the side having the radial center of said first circle curve, each of said pair of S-shaped edges comprised of said first and second arcs and first and second straight lines having one of the arcs of a larger radius than the other arc, said pair of generally S-shaped edges cooperating such that, in use, the larger arc of said first S-shaped edge for drafting the front portion of a sleeve curve is opposed to the smaller arc of said second S-shaped edge for drafting the back portion of the sleeve curve, the smaller arc of the first S-shaped edge being opposed to the larger arc of the second S-shaped edge, and the second straight line portions are substantially adjacent and substantially parallel through their length, and utilizing said device to mark on said substrate surface a sleeve length determining the sleeve armhole depth for a garment perpendicular to the length of the sleeve, marking the substrate surface with a line corresponding to the first of said S-shaped edges, said line extending between the top of the sleeve length and the end of the sleeve armhole depth to define the front curve of the sleeve, and marking the substrate surface with a further line corresponding to said second S-shaped edge, said further line also extending between the top of the sleeve length and the end of the sleeve armhole depth for defining the back curve of the sleeve.

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