

May 12, 1959

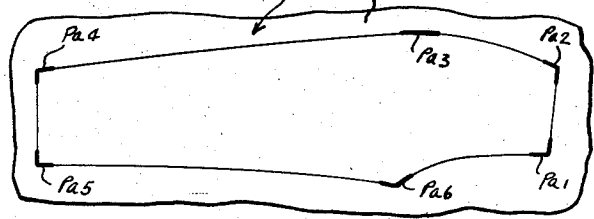
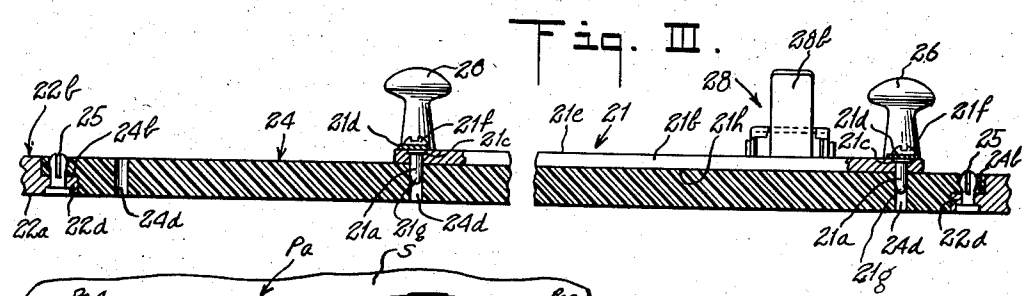
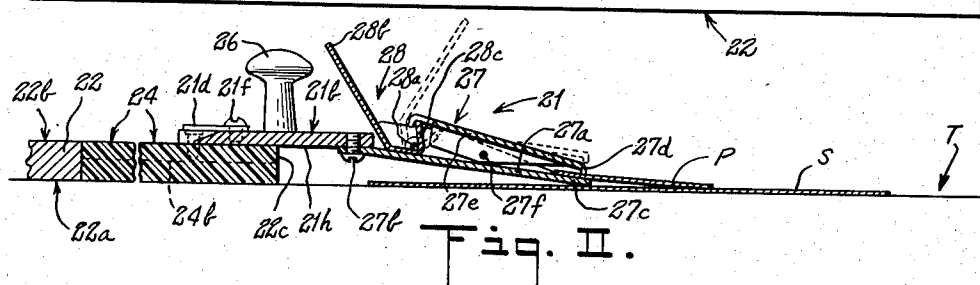
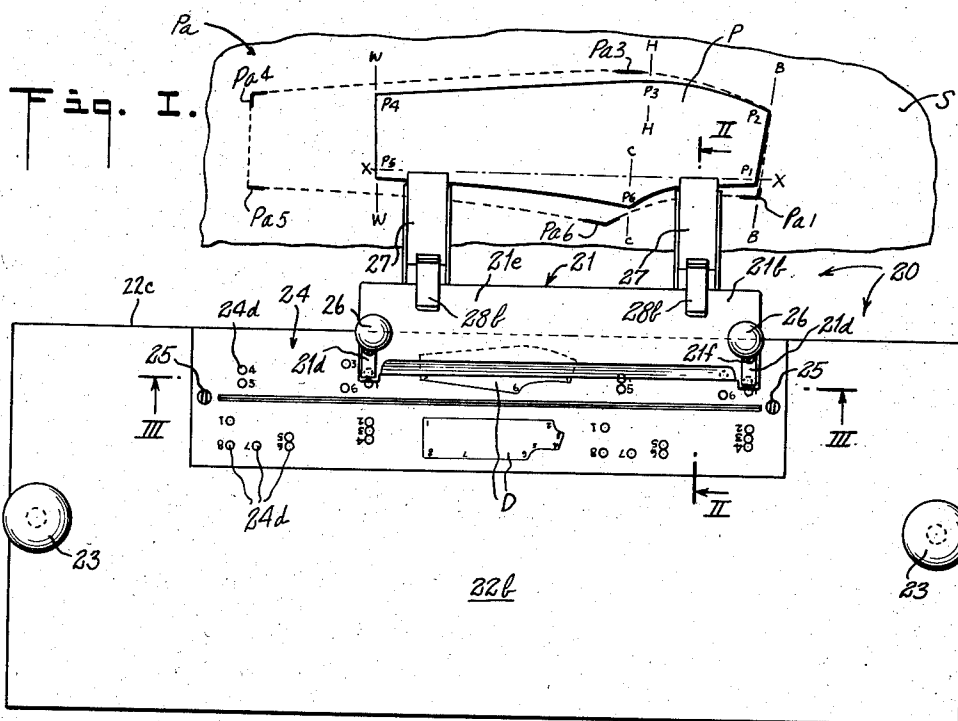
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2,885,784

APPARATUS FOR PATTERN GRADING OF WEARING APPAREL

Filed May 28, 1956

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. IV.

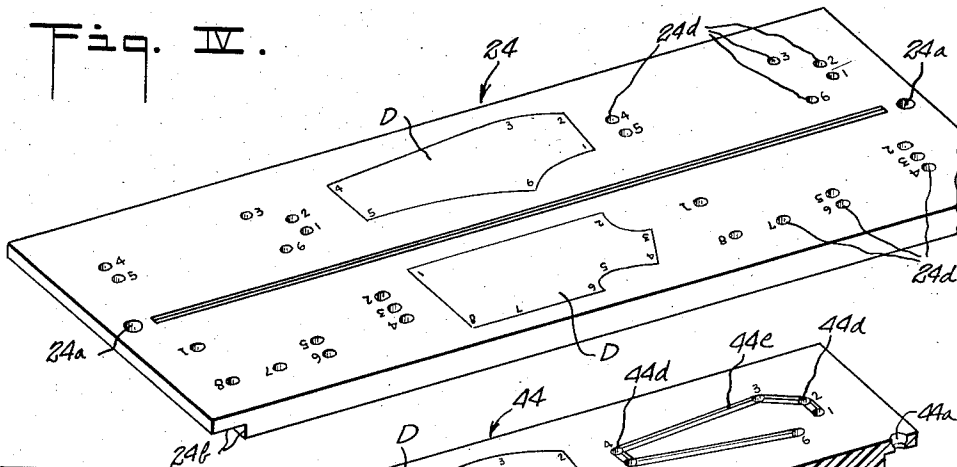


Fig. V.

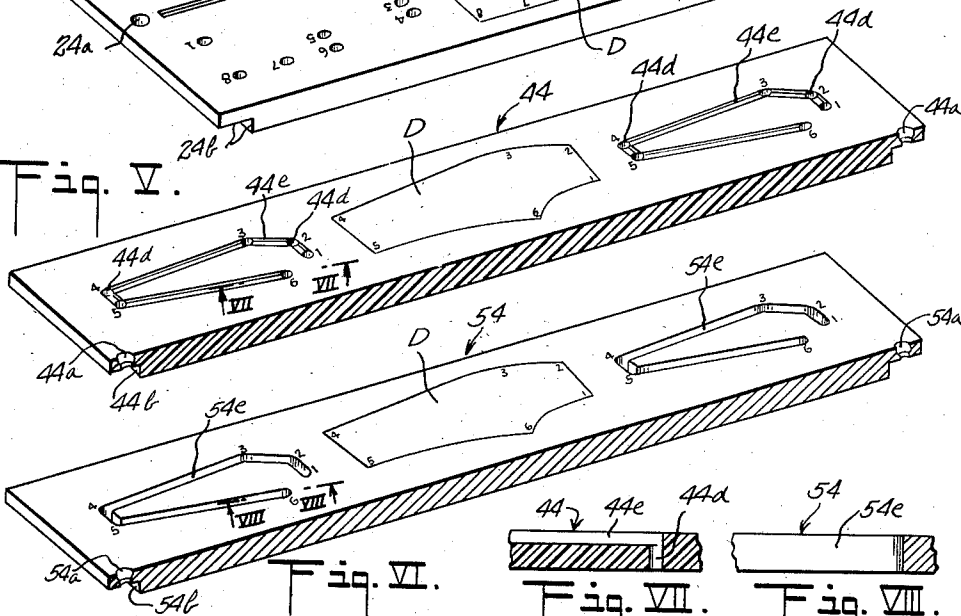


Fig. VI.

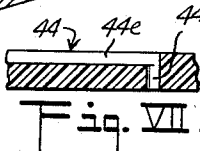


Fig. VII.

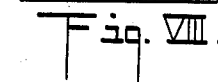


Fig. VIII.

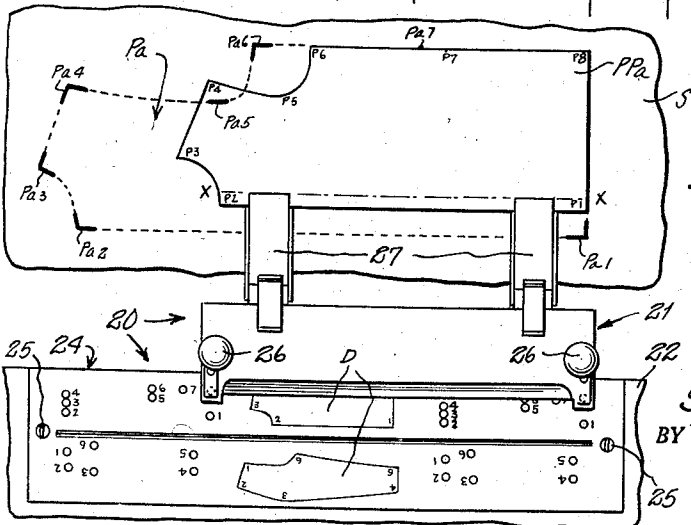


Fig. IX.

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APPARATUS FOR PATTERN GRADING OF WEARING APPAREL

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6 Claims. (Cl. 33—12)

This invention relates to the commercial manufacture of wearing apparel, and more particularly is directed to an improved apparatus for pattern grading, that is, producing sets of proportional patterns of a desired range of sizes from a master pattern of a model garment, or the like, especially as used in quantity production in the clothing manufacturing trade.

Among the objects of the invention is to provide an improved apparatus of the character described which apparatus shall comprise few and simple parts that are readily assembled in a compact combination which shall be simple to manipulate requiring a minimum skill, which shall be cheap to manufacture, which shall be effective to produce predetermined proportional sized pattern sets of a desired range from a master pattern set of a model garment, and which shall be practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out. The invention accordingly consists of features of said apparatus constructions, combination of elements and arrangement of parts which will be exemplified in the constructions hereinafter described and of which scope of application will be indicated in the following claims.

Fig. I is a top plan view of a pattern grading apparatus constructed to embody the invention showing one of the pieces of a master pattern in an initial position in the process of producing a proportional sized pattern, the latter being shown in the successive steps in dot and dash outline.

Fig. Ia is a fragmentary view of the sheet with the graded sized pattern developed in outline corresponding to that shown in dotted lines in Fig. I.

Figs. II and III are fragmentary enlarged cross-sectional views taken on lines II—II and III—III, respectively, in Fig. I showing pattern piece carrier releasably interconnected to the operational sizing control guide plate of the base frame of said improved apparatus.

Fig. IV is a top perspective view of control guide plate shown in Fig. I removed from said improved apparatus.

Figs. V and VI are top perspective views similar to Fig. IV showing portions of modified forms of control guide plates constructed to embody the invention.

Figs. VII and VIII are fragmentary cross-sectional views taken on line VII—VII in Fig. V and line VIII—VIII in Fig. VI, respectively, showing details of construction of said modified forms of said control guide plates, and

Fig. IX is a fragmentary top plan view similar to Fig. I of another piece of a master pattern showing in outline successive steps of the improved process of practising the method embodying the invention.

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Referring in detail to the drawing and as seen from Fig. I, 20 denotes a garment pattern grading apparatus construction to embody the invention. Said apparatus 20 may comprise a carrier 21 for a master pattern piece P mounted for relative movement on a frame base 22. The latter as here shown may be made of a suitably weighted material, such as metal in flat sheet or bar form of iron, steel, or the like, and if desired may be molded of a suitable plastic resin, said frame base 22 having a smooth under-surface 22a to provide a steady rest on a horizontally disposed work surface or table top T.

Said frame base 22 may have any suitable shape and as shown in Figure I is rectangular with spaced apart knobs or handles 23, extended up from a top surface 22b thereof for convenience of lifting and moving said apparatus 20 when required. Inlaid into the frame base 22 to extend longitudinally midway along and adjacent a leading edge 22c thereof there is demountably secured a control plate 24 by any suitable means such as a snap fastener formed with spaced apart spring split end pins 25 upstanding to extend through cooperatively located holes 24a provided in said plate 24.

Said control plate 24 as shown in Fig. I may be made to lie flush with said frame base upper surface 22b and may have opposite end portions thereof through which said spring ended pins 25 extend under-cut as at 24b to extend and fit on joint forming extending ledge 22d recessed from frame base 22 on which said spring ended pins 25 are securely mounted as is clear from Figs. I and III.

To mount carrier 21 and master pattern piece P for predetermined limited control movement with respect to frame base 22, there may be provided associated groups of detachably interconnectingly fitted elements, as for example, an aligning pair of pins 21a shown in Figs. II to III spaced apart and retained to project in a downwardly direction from carrier 21 for entering and slidably fitting into one pair of a plurality of openings 24d correspondingly spaced apart and sized to pins 21a provided in control plate 24. Said pair of openings 24d accommodating pins 21a as here shown, positively insure longitudinal alignment requirements in producing a desired graded sized pattern piece Pa from master pattern piece P, the latter being secured to move with carrier 21 in the manner hereinafter described.

For a simple shaped pattern piece P shown in Fig. I, six pairs of openings 24d may be used, and as denoted in Figs. I and IV each successive pair may be marked by suitable indicia, as for example, "1," "1," "2," "2," "3," "3," "4," "4," "5," "5," and "6," "6." The individual openings 24d of each pair may be segregated in two groupings located at opposite end portions of said plate 24 adjacent the pin receiving holes 24a as shown in Figs. I, III and IV.

Pattern carrier 21 may be made of a suitable flat sheet strip 21b of metal or molded plastic resin and of sufficient length to accommodate mounting of the pins 21a to correspond with separated group arrangement and spacing of said pairs of openings 24d. Said pins 21a when forming separate metal elements may each have a headed end 21c and be replaceably counter-sunk into top facing side 21e of strip 21b, each pin 21a being resiliently secured in position by a suitable leaf spring 21d overlying said headed end 21c. Said springs 21d each may be fastened to said strip up-facing side 21e by anchoring screws 21f so that the leading pointed ends 21g of said pins 21a

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extend down from the bottom side 21h of said strip 21b, effective to be selectively fitted in pairs of openings 24d, when mounting carrier 21 on frame base 22, as is clear from Figs. I to III.

For lifting and moving said carrier 21 independent of frame base 22 during the pattern grading operation suitable means may be provided such as finger gripping knobs 26 securely to upstand from said strip up-facing side 21e.

Each master pattern piece P may be secured to move with carrier 21 so that when the latter is firmly seated on frame base 22, carrier 21 may be in an overhanging position to extend beyond said edge 22c, and one or more suitable clamps 27 may be provided to releasably grip said pattern piece P, preferably along a longitudinally extending border thereof as is shown in Figs. I and II. Clamp 27 may be of any conventional construction, and as here shown two spaced clamps 27 are utilized to retain said pattern piece P firmly against accidentally shifting from gripped position to move as a unit with carrier 21.

Each clamp 27 may include a relatively fixed jaw member 27a which is rigidly attached by one end thereof to carrier 21, as by fastener screws 27b. Gripping end 27c terminates member 27a to cooperate with a gripping end 27d of a hinged jaw 27e pivoted at 27f midway between the screw fastener 27b and said gripping end 27c. For locking each of said clamps 27 in effective gripping position, a rock lever 28 pivoted at 28a on fixed jaw member 27a and formed with a finger release arm 28b and a latching arm 28c opposite said release arm 28b may be provided. Each clamp 27 may be locked to firmly grip master pattern piece P between said jaw member gripping ends 27c and 27d as shown in full line in Fig. II and released for removal from said gripped position when level 28 is swung into the shown dotted line position.

The utility and operation of the improved apparatus 20 will now be apparent. After constructing and assembling the parts above described and shown in Figs. I to IV, inclusive, each master pattern piece P forming a set required to produce a garment is firmly lock gripped between jaw member ends 27c and 27d of clamp 27 preferably along a reference or bench line X—X shown in Fig. I in dot and dash to extend longitudinally of said pattern piece P, inwardly an edge thereof and as here shown may be positioned centrally with respect to the ends thereof.

Starting with carrier 21 first firmly mounted in position on frame base 22 with pins 21a engaging into a first pair of openings 24d, as for example, those of the spaced groups indicated by "1," "1," and with said pattern piece P securely gripped by clamp 27 as described above, marking Pa1 is spotted by a point, but preferably by a short line or lines extending in the direction or directions of the contour of said pattern piece P, as for example, at a corner angle at portion P1 of pattern piece P on a sheet S which ultimately is to form a corresponding pattern piece Pa of predetermined desired size of a graded pattern set as will be clear from Fig. I.

Carrier 21 with pattern piece P is then moved as a unit to a second firmly mounted position on frame member 22 with pins 21a shifted to engage into another pair of openings 24d, namely, those indicated by "2," "2," the latter also being spaced apart equal to the spacing of pins 21a, marked "1," "1" and short angle line markings Pa2 are spotted, that is, drawn on sheet S to extend along the contour at the top corner region portion P2 of the said pattern piece P.

The spacing of openings 24d designated "2," "2" from those designated "1," "1" may be made to correspond to the predetermined grade size proportioning of the regional area portions of said pattern pieces, such as along a bottom bench line B—B shown in Fig. I passing through corner P1 and P2 for locating markings Pa1 and Pa2, respectively, on sheet S when carrier 21 is successively positioned with pins 21a engaged in openings 24d desig-

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nated "1," "1," and "2," "2," respectively, said line B—B extending in an angular relation to said longitudinal bench line X—X. A knee bench line H—H passing through the knee region portion P3 locates marking Pa3 on sheet S when carrier 21 is positioned with pins 21a engaged in openings 24d, designated "3," "3" and a waist bench line W—W passing through angle corners P4 and P5 correspondingly locates markings Pa4 and Pa5, respectively, on sheet S when carrier 21 is successively positioned with pins 21a engaged in openings 24d, indicated at "4," "4," and "5," "5," respectively. Likewise a crotch bench line C—C passing through crotch region portion P6 locates marking Pa6 on sheet S when carrier 21 is positioned with pins 21a engaged in openings 24d, designated "6," "6."

The directional movements or shift distances of the carrier 21 with the pattern piece P on frame base 22, as from openings 24d, designated "1," "1" to those designated "2," "2," and from the latter to those markings designated "3," "3," and thereafter, are thus in each instance predetermined by differences desired in size grading being produced on sheet S. Therefore if the master pattern piece P is part of a set for manufacturing a front panel of slacks size 14 and an up graded size 16 is to be produced with panel piece Pa, the increase dimensional size requirements, namely, said shift distance will be selected to correspond to the predetermined proportional size requirement.

Abrupt change, that is, deviation of direction of the contour portion of said pattern piece P, either as an angular or rounded crest or trough therein may also be used to determine the number of openings 24d and their relative spacing, as for example, when size grading with master pattern pieces have arm holes contour portions such as shown in Fig. IX. Between said pattern contour portions where there is no abrupt change corresponding to successively designated opening 24d, such directional changes will hereinafter be referred to as being "substantially straight" lines. Thus sheet S may have traced thereon, spot or line mark Pa3 at the intersection with knee bench line H—H corresponding to the portion of the rounded crest P3 of the contour of pattern piece P when the carrier 21 is mounted with pins 21a engaging in openings 24d designated "3," "3," and spot or corner lines marked Pa4 and Pa5 at the intersection of waist bench line W—W corresponding to the corner region P4 or P5, respectively, of pattern piece P after carrier 21 has been successively shifted to engage pins 21a in openings 24d designated "4," "4," and "5," "5," respectively. Similarly spot or line marking Pa6 may be made on sheet S at the junction of rounded trough portions P6 of pattern piece P. Thus said spot markings are made after each successive shift mounting movement of the carrier 21 and pattern piece P with pairs of pins 21a engagingly fitted in openings 24d designated "1," "1"; "2," "2"; "3," "3"; "4," "4"; "5," "5"; and "6," "6," respectively, to determine outline developing markings Pa1, Pa2, Pa3, Pa4, Pa5 and Pa6 on sheet S.

After said markings Pa1 to Pa6 have been spotted on sheet S, they may be connected successively by said "straight lines" for outlining a development on sheet S to produce when cut out the desired graded size pattern piece Pa ready for use with other pieces of the set developed and cut out in the manufacture of garments of predetermined proportions corresponding to the developed size graded pattern pieces of the last mentioned set, as is clear from Figs. I and Ia.

To facilitate joining up the successive markings Pa1 to Pa6 to develop in outline said pattern piece Pa as described above, the corresponding contour portion of the master pattern, slightly extended to reach from mark to mark, may be used as a ruler tracing means. To that end the master pattern piece P is removed from carrier 21 and superimposed on sheet S after markings Pa1 to Pa6 have been spotted thereon. The various portions be-

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tween successive markings $Pa1$ to $Pa6$ are then line connected by matching the corresponding contours of portions of pattern piece P to guide in development of outlining said pattern piece Pa , as shown in Fig. 1a.

Since each garment, such as slacks, has two or more master pattern pieces each, other pattern pieces required to form the complete predetermined size graded pattern set with pattern piece Pa may be produced in the same manner as described above by replacing pattern piece P gripped in position to carrier 21 by clamps 27 by another master pattern piece, such as a rear side panel, and a corresponding graded sized pattern piece spotted, and traced for developing in outline thereof, on another blank area of sheet material S , and then cut out in the same manner as described above for producing each size graded pattern piece required.

Each size graded pattern piece of the set may if desired be made from a different control plate 24. However the same control plate 24 may also be made to serve for producing a plurality of pattern pieces, as for example, two independent grouped pairs of openings 24d may be provided for, namely, said pattern piece Pa and another pattern piece PPa which may be for a front panel of a sleeveless jacket to be part of a garment associated with the slacks requiring size graded pattern piece Pa , as is clear from Figs. I and IX.

For size graded pattern pieces Pa , as described above and from the drawing, only six numbered grouped pairs of openings 24d on control plate 21 are required, pattern piece PPa as here shown requires a different numbered grouped pair of openings 24d, namely, "1," "1," "2," "2," "3," "3," "4," "4," "5," "5," "6," "6," "7," "7," and "8," due to the arm-hole shaping, and additional control plates 24 being furnished as part of apparatus 20 as required by the number of master pattern pieces in each set.

Control plate 24 may be of suitable machine or molded construction, and when molded may be of colored or clear resinous plastic material which can have impressed thereon directions or diagrams as at D and said indicia enumerated in a clear legible manner.

With above apparatus 20 the making of only a one up-graded size pattern piece set has been described, as exemplified, by up-size grading from size 14 to size 16 in producing pattern pieces Pa from master pattern piece P .

To make pattern pieces for other sizes, as for example, a size 18, said pattern piece Pa , namely that produced for size 16, is utilized as the master pattern piece instead of said pattern piece P and same control plate 24 may be used with openings 24d spaced and arranged in predetermined relation for enabling the workman to draw in outline development and cut out the required size graded pattern piece for size 18 by repeating the same steps of procedure as described above for making pattern piece Pa with master pattern piece P .

By utilizing other control plates 24 master pattern piece P may be up or down grading in full or in-between-sizes as well as for making combination sized patterns, such as for the production of a 16 size hip measurement with a 14 size waist line measurement garment.

Figs. V and VII show a modified form of control plate 44 which is like control plate 24 in shape and size, and may be formed with end under-cut portions 44b and anchoring holes 44a. In addition control plate 44 is provided with a grooved track 44e interconnecting successive openings 44d, that is, from those marked with numeral "1" to those successively marked to numerals "6." This modification of control plate 44 may be installed in place of control plate 24 above described for apparatus 20 and facilitates shifting carrier 24 in laying out each graded sized pattern piece Pa since pin ends 21g may be directly guided in track 44e for successively entering into said openings 44d.

Another modification of control plate 54 embodying the invention is shown in Figs. VI and VIII. This control plate 54 is likewise shaped and sized like control

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plate 24 and may be substituted therefor, said control plate 54 being formed with under-cut end portions 54b and anchoring holes 54a.

With pins 21a of carrier 21 formed of steel, iron or other permeable material, said control plate 54 may be made to have suitable magnetic properties, that is, permanently magnetized so as to retain said pins 21a in any shifted position for spot or line marking at the successively numbered portions "1" to "6" of a slideway 54e extending therebetween.

It should also be noted that pins 21a used with control plates 44 or 54 may if desired be formed in the well understood manner to interlock in grooved track 44e or slideway 54e, respectively, to prevent dismounting of carrier 21 from frame base 22 except for providing the necessary limited movement therebetween to operate as above described.

Whereas apparatus 20 fitted with either control plate 24 or 44 requires the carrier 21 to be lifted free from control plate 24, or partially lifted from seated position with respect to control plate 44 to clear openings 44d in track groove 44e, control plate 54 may be made with a through slotted slideway 54e and the carrier 21 may be moved by sliding without lifting successively for spot tracing for forming graded size pattern piece Pa in the manner above described.

It will thus be seen that there is provided an apparatus of the character described whereby the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A pattern size grading apparatus comprising a frame base, a carrier mounted for selective positioning with respect to said base having a portion for releasably securing a master pattern piece to move therewith beyond said frame base, said master pattern piece having a series of designated points arranged at spaced distances around the periphery thereof in sufficient number to define the contour of the pattern when connected by substantially straight lines, and a series of predetermined carrier positioning indicia carried by a portion of the frame base, each of said indicia corresponding to one of said designated points on the master pattern piece whereby the carrier is aligned successively with each index to determine the position of the designated points defining the contour of the next size pattern.

2. The pattern size grading apparatus defined in claim 1 in which the portion of said frame base carrying said indicia is of demountable construction for interchanging with other portions having indicia corresponding to other master pattern pieces.

3. The pattern size grading apparatus defined in claim 1 in which said portion of the frame base carrying the indicia is a demountable control plate, said plate having openings serving as said indicia, and pin means carried by said carrier for engaging in each of said plate openings to effectuate said alignment thereof.

4. The pattern size grading apparatus defined in claim 1 in which said portion of the frame base carrying the indicia is a demountable control plate, said plate having openings serving as said indicia, pin means carried by said carrier for engaging in each of said plate openings to effectuate said alignment thereof and additional control plates each having indicia corresponding to other master pattern pieces for forming a complete pattern set.

5. The pattern size grading apparatus defined in claim

1 in which said series of predetermined carrier positioning indicia are formed as spaced apart openings, and pin means carried by said carrier for engaging in each of said openings to effectuate said alignment thereof.

6. The pattern size grading apparatus defined in claim 1 in which said series of predetermined carrier positioning indicia are formed as spaced apart openings, pin means carried by said carrier for engaging in each of said openings to effectuate said alignment thereof, and a grooved track extending to interconnect said openings

for guiding said pin riding therein from opening to opening when moving the carrier with respect to said base.

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