

Sept. 21, 1954

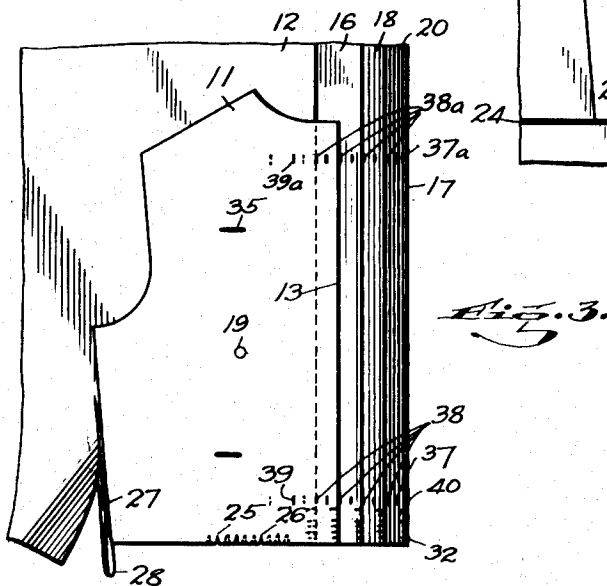
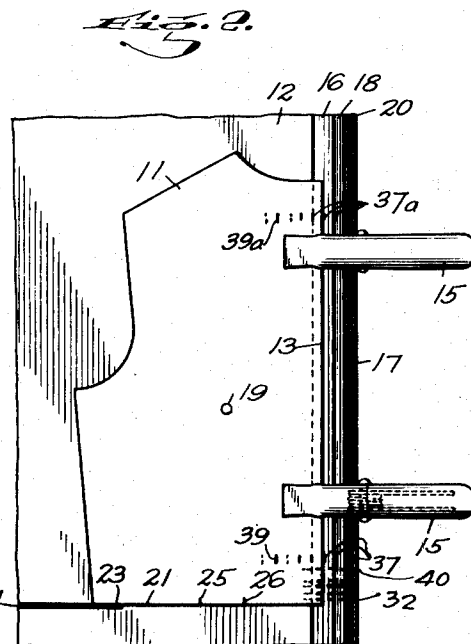
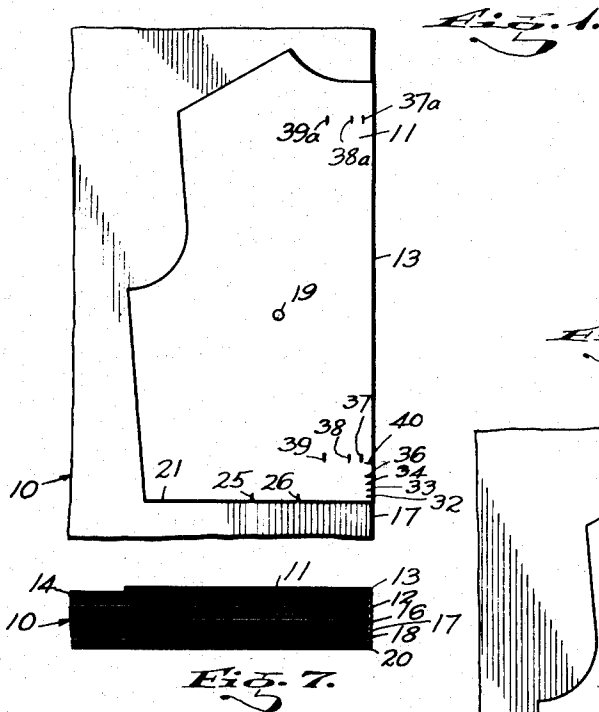
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2,689,402

METHOD OF GRADING PATTERNS

Filed June 4, 1951

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

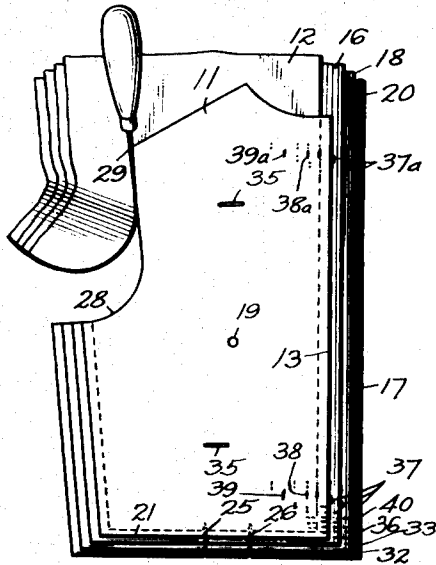


Fig. 4.

Fig. 5.

Fig. 6.

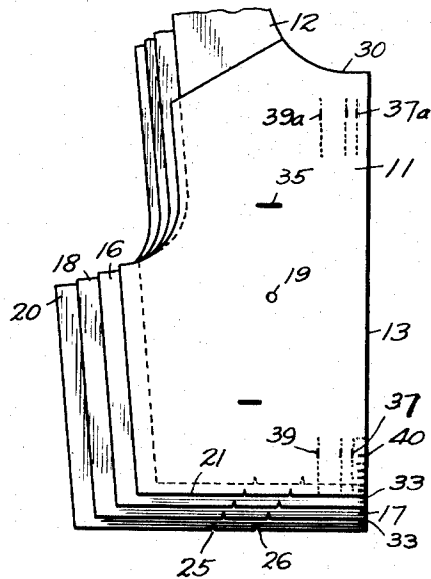
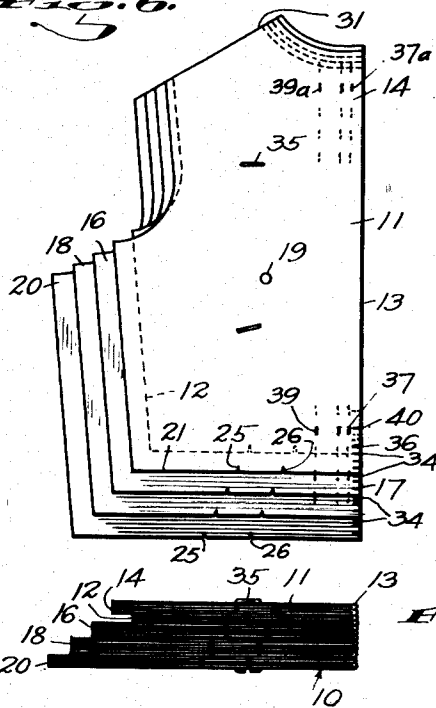


Fig. 8.

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METHOD OF GRADING PATTERNS

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14 Claims. (Cl. 33—17)

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This invention relates to the grading of patterns for garments and particularly to a method whereby all of the patterns of one style in any of the usual range of sizes may be graded simultaneously on a quantity production scale.

In the field particularly of manufacturing women's wear such as dresses in large quantities, popular garments of any one style are customarily made in all the size ranges such as juniors which are sizes 9 to 19, misses sizes 12 to 20 and women's sizes 36 to 46, thereby necessitating the production of a considerable number of patterns for each style. In shops producing many styles of garments, the patterns needed for the various styles and sizes for each style run into a relatively large number. In the misses' range of five sizes 12, 14, 16, 18 and 20 a basic pattern for a selected size as size 14 is first made, after which the patterns for the remaining sizes are graded individually from the basic pattern, one size at a time and this at present is and necessarily has been the customary procedure involving considerable time, effort and expense besides being subject to cumulative errors. Insofar as I am aware, no attempt has ever been made to grade patterns commercially on a wholesale or mass production scale in the garment field, as it has been considered impossible to do so because of the differences in patterns.

The present invention therefore contemplates the provision of a method of grading at one time any number of the same or different patterns of the same style in any range of sizes for most types of outer garments requiring graded patterns, whether in the children's, juniors', misses' or women's range, and for certain types of men's garments, whereby a multiplicity of the required patterns may be produced simultaneously by handling as a unit all the blanks from which the various patterns are made, and shifting the blanks relatively to each other preparatory to making cuts for the respective pattern edges successively and between shifts through the entire pile or stack of blanks.

The invention further contemplates the provision of an economical method of grading patterns, eliminating certain of the operations required by present methods and combining other operations whereby a stack of pattern blanks at a time are manipulated, clamped and cut to produce a complete set of graded patterns at one time instead of one at a time.

The various objects of the invention will be clear from the description which follows and from the drawings, in which

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Fig. 1 is a top plan view of a typical basic pattern put in folded position on the top of a stack of folded paper pattern blanks preparatory to grading the entire stack as a unit, each of the blanks being large enough to have the largest pattern desired cut therefrom, the thickness of the paper being exaggerated for clarity.

Fig. 2 is a similar view of the stack after the folded blanks have been shifted transversely and the stack clamped together, showing the first or bottom cut being made by a suitable saw through the entire stack.

Fig. 3 is a similar view of the stack with the blanks shifted again to align those edges of the inchoate patterns which are to become the left edges, showing the stack stapled together and the second cut at said left edges being made through the stack by a pair of shears.

Fig. 4 is a similar view of the next shifted and stapled position of the stack with the edges which are to become the edges of the patterns at the arm holes coinciding and the cut made there-through the entire stack with a knife.

Fig. 5 is a similar view of the stack showing the partly finished patterns shifted again into position to align the edges of the patterns at the neck opening and showing said edges cut and coinciding.

Fig. 6 is a similar view of the stack showing the shoulder lines of all the patterns coinciding and cut.

Fig. 7 is a side elevational view of the folded stack of blanks shown in Fig. 1 and showing enough blanks to make several of each size.

Fig. 8 is a similar view of the finished stack constituting the complete graded patterns before they have been unclamped and separated from each other.

The invention has been illustrated and will be described in connection with misses' sizes of women's wear such as dresses. It will be understood however, that the invention may be applied also to children's and men's wear of certain types requiring the grading of patterns and in any range of sizes, that any number of patterns of any selected sizes may be graded in the same stack and that the invention is not limited to making all of the patterns of different sizes as any selected number of each size may be made during the grading operation. As shown in Fig. 8, a duplicate of the basic size 14 pattern has been made at the same time that two of size 12, three of size 16, three of size 18 and two of size 20 are graded by my method, making eleven patterns in the stack of five different sizes. The

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patterns are made of the usual strong, relatively stiff paper or other suitable material but without the necessity for marking outlines, the respective edges of the basic pattern 11 serving as cutting guides. The blanks designated 12 are for size 12 patterns, blanks 14 are for size 14, blanks 16 are for size 16, blanks 18 for size 18 and blanks 20 for size 20.

Said basic pattern 11 is usually of size 14 in the range of sizes herein illustrated and if symmetrical as shown, is folded in the usual manner as at 13 along the middle line thereof. The paper blanks 12, 14, 16, 18 and 20 are first folded and stacked, each blank being large enough for the largest size to be graded, in this case size 20 as seen in Fig. 1 for ease in cutting and stacking and blocking out the blanks from a multiply roll, stack or the like. The folds 17 of the blanks and the fold 13 of the pattern 11 are made coincident and the blanks of the stack are then temporarily fastened together in any convenient manner in the thus stacked positions thereof.

As shown in Fig. 2 for purposes of illustration, the invention not being limited thereto, suitable spring-pressed quick-action clamps as 15 may be employed to clamp the stack in any shifted position of the individual blanks. Each clamp shown is of two parts pivoted together and having their operative ends urged together by a coil spring around the pivot, one end of the spring bearing against one part and the other end designed to be opened up widely enough to receive the stack and to exert enough spring pressure thereon to prevent any relative movement of the pattern blanks after they have been shifted into the required positions for cutting with corresponding edges in predetermined stepped relation. However, the blanks may, if desired, be quickly stapled together in the positions shown for example in Figs. 3-6, the staples 35 being of the thin wire type which are easily opened up and withdrawn to free the blanks from each other. It being the purpose of the present invention to eliminate difficult and time consuming operations, it will be understood that any suitable quickly detachable and quickly acting attaching tools may be employed for holding the pattern blanks in place in the stack after they have been shifted and prior to the cutting operation thereon.

The blanks having been arranged as in Fig. 1, any desired mark common to all of the finished patterns may be made through the stack for reference or other purposes. Cuts 32, 33, 34 and 36, spaced apart the same distance as that between the cut 32 and the bottom edge 21 of the pattern 11, are made perpendicularly across the folded edge parts of the entire stack of blanks as well as across the pattern 11. The cuts so made are in the same relative positions in all the blanks and serve as individual indications for the spacing of the blanks horizontally or vertically. The cuts mentioned eliminate the need for measuring or otherwise marking the blanks or the amount of overlap or overhang thereof on the adjacent blank. They indicate the amount of relative vertical shifting of the consecutive or alternate patterns, which amount is the same between consecutive sizes. However, a special cut 40 for the size 12 patterns is made above the cut 36. The distance between the cuts 40 and 36 is twice that between the other consecutive cuts because the pattern blank 12 is placed on a preceding blank 16 in the stack and sizes 12 and 16 are not consecutive but are alternate sizes, one being two sizes different from the other. Size 14

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being the master pattern, it is placed on the top of the stack and not between blanks 12 and 16 where it would normally be expected. Hence blank 12 is shifted twice the normal distance between consecutive blanks relatively to the blank 16 and the special cut 40 is made accordingly, but is utilized only for pattern 12 in the present illustration.

Similarly, cut 37 is made through the pattern 11 and all the blanks in the stack simultaneously and at the required distance from the folds of the blanks to indicate the smaller amount of the shifting movement horizontally of consecutive blanks (Figs. 2 and 4). The second cut 38 is made preferably the same distance from the cut 37 as the latter is from the fold 13 or 17 to indicate the double spacing as required for Fig. 3. The special cut 39 is to indicate the spacing between the blanks 12 and 16 in Fig. 3 as double that of the consecutive blanks or patterns for the reason already explained in connection with the special cut 40. Since the cuts 37, 38, 39 are made preferably near the lower parts of blanks in the stack, it is advisable to make a duplicate set of cuts 37a, 38a and 39a respectively aligned with the cuts 37, 38 and 39 and similarly spaced from each other and from the folds, said cuts being made near the upper part and through all of the blanks of the stack simultaneously so that the folds are maintained parallel when the blanks are shifted, each fold being aligned with two corresponding cuts in a manner soon to be explained.

After all of the indicating cuts have been made in the stack, the next step is to arrange the blanks in their new shifted positions which depend on the first edge to be cut. As shown, the blanks are shifted into generally stepped relation preparatory to cutting the corresponding bottom edges of all the blanks simultaneously, cutting the holes 19 through the stack and also making in the cut bottom edges the notches as 25, 26 common to all of the blanks to indicate for example the position and width of a dart in each blank tapering to the hole 19.

As shown in Fig. 2, the blanks 12 have been shifted horizontally to arrange the folds thereof to the left of the fold 13 of the basic pattern 11, while the preceding blanks 16, 18 and 20 have been shifted to the right of the fold 13 to arrange the respective folds thereof in stepped relation the required distance from the fold of the preceding blank whereafter the blanks are clamped or stapled together. The required distance between the folds of successive blanks need not be measured and is the distance between the fold of the blank being set and the cut 37 of the preceding larger sized blank in the stack. In detail, the blank 18 is shifted so that its folded edge is aligned with the cuts 37 and 37a of the blank 20. The blank 16 is then aligned with its fold at the cuts 37 and 37a of the blank 18; the blank 12 has its fold at the cuts 38 and 38a of the blank 16 and the pattern 11 has its fold at the cuts 37 and 37a of the blank 16, it being now understood that the blank 16 is used to align both the next blank 12 and the top pattern 11.

Obviously, all of the size 12 blanks are shifted the same amount as the other size 12 blanks with the folds coincident. The same is true of the size 14 and 16 blanks and of the others in the stack. The outlines of the blanks for the same size being the same, the multiplicity of shifted patterns and blanks of the same sizes are not separately shown and cannot be indicated in Fig. 2 but are shown in Fig. 8. The entire

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clamped or stapled stack, consisting in the case illustrated of eleven folded blanks or twenty-two thicknesses of paper, exclusive of the basic pattern, is now cut along the common or coincident bottom edge 21 thereof by means of any suitable cutting tool. In Fig. 2 is shown a jig-saw blade 23 for this purpose, said blade being preferably mechanically reciprocated in a motor operated machine. The bottom cut 24 having been made by the saw or otherwise, the dart notches 25, 26 or other required common marks or cuts are made in the still coincident bottom edges of the inchoate patterns and the hole 19 cut through the stack if desired, after which the clamps 15 or staples 35 as the case may be, are removed, freeing the individual incomplete patterns from each other.

Preferably, the side or second set of edges of the patterns are then cut by again shifting the freed blanks into the relative positions thereof shown in Fig. 3, wherein the stepped relation or spacing between the folds of consecutive blanks is doubled from the position of Fig. 2 to carry into coincidence the theoretical lines destined to become, and which in the blanks are, the inchoate side edges of the patterns. That is, the blank 18 is shifted to the left on the blank 20 until its folded edge coincides with the cuts 38 and 38a of the preceding blank 20. Blank 16 is shifted to the left until its fold coincides with the cuts 38 and 38a of the blank 18. Blank 12 is shifted to bring its fold into coincidence with the cuts 39 and 39a of the preceding blank 16. Finally the pattern 11 is shifted to bring its fold to the cuts 38 and 38a of the blank 16. The blanks so arranged are again clamped or stapled and the cut 27 made through the entire stack without any necessity for tracing the outline of the cut to be made but merely by following the selected edge of the basic pattern as a guide. In Fig. 3, the shears 28 are illustrated as performing the cutting operation, it being understood that any of the cuts may be made by any suitable means.

The stack is then again unfastened and the individual incomplete patterns again shifted to the relative positions of Fig. 4 wherein the folds and side edges are symmetrically spaced in stepped relation, the respective folds coinciding with the cuts 37, 37a of the preceding blank and the bottom edges being similarly spaced at the respective cuts 32 of the respective preceding blanks to bring into coincidence what ultimately will be the edges of the arm holes of the completed patterns. The fold of the blank 12 however, is at the cuts 38, 38a of the blank 16 and its bottom edge 21 is at the cut 33 of the blank 16 for the reasons hereinbefore explained. The pattern 11 is in normal shifted position relatively to the blank 16, its fold being at the cuts 37, 37a of the blank 16 and its bottom edge at the cut 32 of blank 16. After shifting, the patterns are re-clamped or again fastened in a stack and the arm hole cut 28 made through the entire stack by any suitable tool, the knife 29 being shown for illustrative purposes in Fig. 4.

The unclamping, shifting and re-clamping and cutting of the stack are repeated in the same manner to cut the coincident neck lines 30 as shown in Fig. 5, the horizontal shifts being to make the folds of all the blanks coincident and the vertical shifts to bring the edge 21 of each blank except blank 12 into coincidence with the cut 33 of the preceding blank. The edge 21 of blank 12 is at the cut 36 of blank 16. The bot-

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tom edge 21 of pattern 11 is at the cut 33 of blank 16. Finally, to cut the final coincident shoulder lines 31 as shown in Fig. 6, the folds of all the blanks remain coincident, while the vertical shift is increased over that of Fig. 5 by one additional space, bringing the bottom edges 21 into coincidence with the cut 34 of the preceding blank. The edge 21 of the blank 12 is at the cut 40 of the blank 16 and the bottom edge 21 of the basic pattern 11 is at the cut 34 of the blank 16. The final positions of the completed patterns in the stack are shown in Figs. 6 and 8. After completion, the patterns are unfastened and freed of each other and separated ready for use.

It will be noted that the method herein disclosed is peculiarly adapted for performance by mechanical means such as machine tools of the proper kind, that stack indications and cutting of differently sized patterns in the same stack replaces individual cutting, that measuring and marking of individual patterns and the cumulative errors frequently inherent in such marking and measuring are eliminated, that inspection of the clamped stack shows at a glance whether the patterns have been shifted the proper distance, that the time required for pattern grading and the expense involved therefor may be greatly reduced over present relatively slow and cumbersome methods, that the method is applicable to all the patterns in women's outer garments and to many types of other garments and that I have provided a method well designed for commercial mass production of graded patterns.

Various obvious changes may be made in the method herein shown and described without departing from the spirit of the invention defined in the appended claims and I therefore intend the above disclosure to be illustrative rather than limitative of the invention.

I claim:

1. The method of grading patterns from a basic pattern comprising providing a stack of pattern blanks each larger than the basic pattern and large enough to be cut into a pattern of the largest size in the desired range of sizes, placing the basic pattern on the top of the stack, shifting the blanks into positions wherein selected corresponding inchoate first edges of the ultimately different patterns to be cut from the respective blanks are coincident with each other and also coincident with the corresponding first edge of the basic pattern, clamping the shifted blanks together, cutting through the entire stack along said first edge of the basic pattern as a guide, prolonging the cut past said first edge to sever the waste from the stack, unclamping the stack, again shifting the individual blanks of the stack to bring into coincidence with each other and with a second edge of the basic pattern a set of corresponding inchoate second edges of the respective ultimate patterns to be cut from the blanks, re-clamping the stack in the shifted positions of the blanks, cutting through the stack along said second edge of the basic pattern as a guide, and repeating the unclamping, shifting, clamping and cutting operations successively with the remaining edges of the basic pattern as guides and until the entire stack of blanks has been cut into graded patterns corresponding to the basic pattern but differing in size therefrom.

2. The pattern grading method of claim 1, the basic pattern being folded along its middle, folding the blanks approximately in half before stacking the blanks, the fold of the basic pattern and the folds of the blanks being made

coincident during the cutting of the corresponding aforesaid first inchoate edges.

3. the pattern grading method of claim 2, and during each shifting operation on the blanks in the stack arranging the blanks so that previously cut corresponding edges thereof are spaced apart the required distances to grade the patterns.

4. The method of grading patterns comprising placing a basic pattern on a stack of more than two pattern blanks, producing a first set of corresponding coinciding edges on the blanks, arranging the blanks in the proper relation to each other and to the basic pattern while in the stack to separate the first set of initially coinciding edges into stepped relation and to make coincide a second set of inchoate corresponding edges of the ultimately different patterns inchoate in the respective blanks, clamping the blanks together in said proper relation, cutting through and from edge to edge of the stack with the second edge of the basic pattern corresponding to the edges of said second set as a guide, unclamping the blanks in the stack and repeating the arranging of the blanks, clamping, cutting and unclamping with each remaining edge of the basic pattern until the ultimately different patterns inchoate in the stack have been completed.

5. The pattern grading method of claim 4, the clamping of the stack being accomplished by pressing the outermost blanks of the stack toward each other to put the stack under compression, and the unclamping being accomplished by releasing the stack from compression.

6. The pattern grading method of claim 4, the clamping and unclamping of the stack being accomplished by stapling the blanks of the stack together before cutting along an edge of the basic pattern and then unstapling the stack after cutting along said edge.

7. The pattern grading method of claim 4, the cutting through the stack being a sawing operation.

8. The method of grading patterns comprising providing enough pattern blanks to furnish any required number of patterns of each desired size and for an entire range of different sizes, stacking the blanks with a basic pattern on the top of the stack, forming first edges on the blanks corresponding to a first selected edge of the basic pattern, shifting the corresponding first edges of the blanks relatively to each other and to the basic pattern the proper distance to bring what is to be a second edge of each pattern into coincidence with a corresponding second edge of the basic pattern and then clamping the stack in the so shifted positions, cutting through and across the stack along the second edge of the basic pattern as a guide, unclamping the stack and repeating the shifting into coincidence clamping cutting and unclamping as many times as there are remaining edges on the basic pattern and for each such edge to produce different patterns of an entire range of sizes and a multiplicity of each size simultaneously from the stack.

9. The method of grading patterns comprising stacking pattern blanks with a basic pattern having a plurality of edges on the top of the stack, successively shifting the blanks as required to make corresponding edges coincide successively for the various edges of the basic pattern and cutting completely through the stack between shifts for each edge of the basic pattern thereby to produce a multiplicity of patterns of different sizes in the same stack and by the same cuts.

10. The pattern grading method of claim 9, clamping the stack after each shift and before each cut and unclamping the stack preparatory to another shift after each cut other than the last cut.

11. The pattern grading method of claim 9, the patterns being marked by cutting equally spaced and doubly spaced indications through the stack of blanks, a single cut being made for each indication which determines the amount of shift between consecutively sized patterns and between alternately sized patterns.

12. The method of grading patterns comprising stacking a multiplicity of pattern blanks intended to produce patterns of different sizes with a basic pattern on top of the stack, making a selected corresponding edge of the blanks coincide throughout the stack, marking the stack simultaneously by making short cuts completely therethrough and spaced apart the distance through which consecutive and alternate blanks are to be shifted, successively shifting corresponding edges of consecutive blanks through said distance relatively to the preceding blank and through twice said distance relatively to a blank two sizes larger, and cutting through all of the blanks of the stack along an edge of the basic pattern between shifts.

13. The method of grading patterns comprising stacking a pile of pattern blanks with a basic pattern on top of the stack, bringing into coincidence a selected edge of the pattern and the corresponding edges of the inchoate patterns to be cut from the stack, cutting spacing indications simultaneously through the stack, shifting the blanks and pattern according to the indications, clamping the stack after shifting, cutting through the stack with the selected edge of the pattern as a guide, unclamping the stack and repeating the shifting, clamping and cutting for the other edges of the pattern.

14. The pattern grading method of claim 13, the indications being equally spaced apart the required distance, except for one indication which is spaced from the adjacent indication double the distance between the remaining indications.

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