March 14, 1944. J. J. KAPLAN 2,343,979

FOUR-IN-HAND NECKTIE

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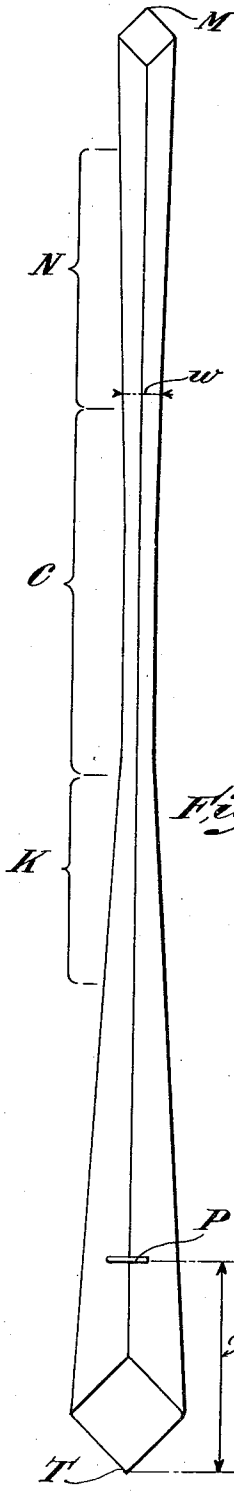


Fig. 1

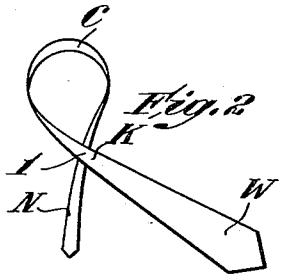


Fig. 2

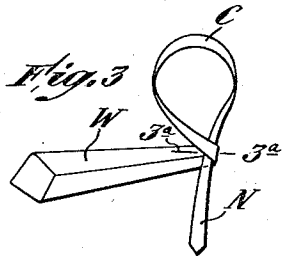


Fig. 3

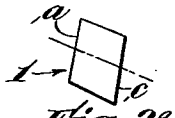


Fig. 2a

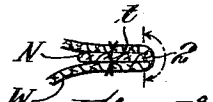


Fig. 3a

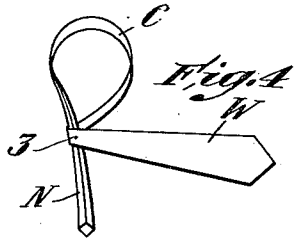


Fig. 4

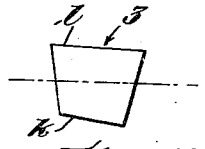


Fig. 4a

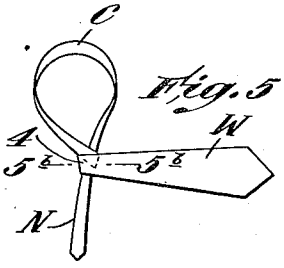


Fig. 5

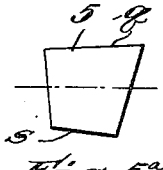


Fig. 5a

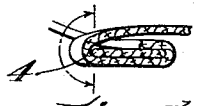


Fig. 5b

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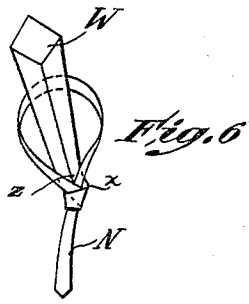
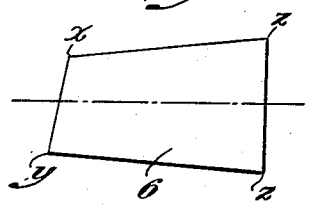


Fig. 6

Fig. 6a



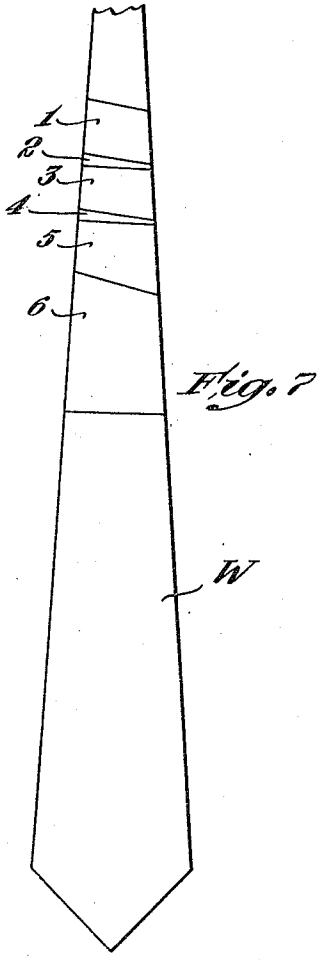


Fig. 7

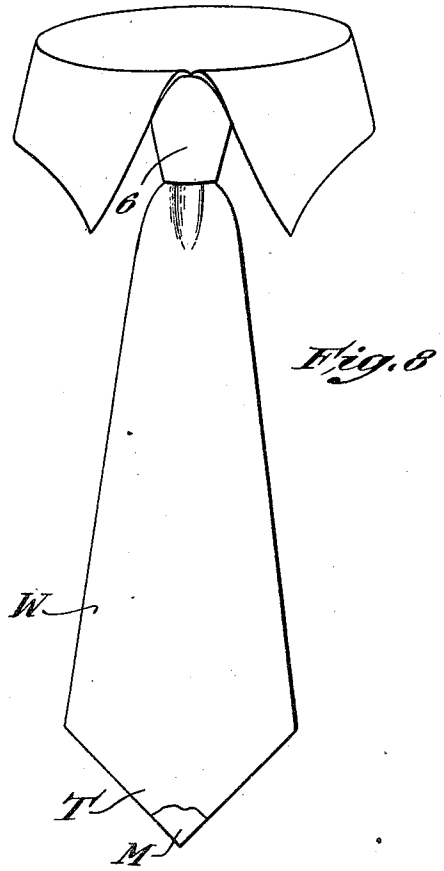


Fig. 8

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UNITED STATES PATENT OFFICE

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FOUR-IN-HAND NECKTIE

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Application October 27, 1942, Serial No. 463,454

1 Claim. (Cl. 2—146)

This invention pertains to neckties of the four-in-hand type and relates more particularly to improvements designed to facilitate the formation of the knot in such a way that after completion of the knot the free ends of the tie will substantially register. I am aware that it has heretofore been proposed to provide a tie with a series of spaced marks corresponding to different collar sizes respectively and intended to facilitate proper location of the knot, but such arrangements are based upon the erroneous assumption that collar size is of material consequence in the proper location of the knot. As a matter of fact, collar size is of minor importance so far as the proper location of the knot is concerned and such a series of indicator elements is confusing and more of a hindrance than a help to the user. The object of the present invention is to provide a tie having a single indicating element at its rear side designed to enable the user so to locate the ends of the tie, relatively to each other, preparatory to forming the knot, that after completion of the knot the tips of the tie will substantially register with each other.

I have discovered that a certain mathematical relationship exists between several factors involved in the proper location of the knot and that recognition of this relationship makes it possible to locate such a single indicating element at such a point in the length of the tie that by its assistance the user may be substantially certain of properly locating the knot regardless of collar size.

In the annexed drawings,

Fig. 1 is a rear view of a tie provided with such a properly located index element;

Fig. 2 is a perspective view illustrating the first step in the formation of the knot;

Fig. 2[a] is a diagrammatic view indicating the shape of the area defined by the crossing of one portion of the tie over the other;

Fig. 3 is a view similar to Fig. 2 indicating the next step in the knot formation;

Fig. 3[a] is a diagrammatic section, to larger scale, substantially on the line 3[a]—3[a] of Fig. 3;

Fig. 4 is a view similar to Fig. 3 but showing the tie as seen from the rear;

Fig. 4[a] is a diagram illustrative of the shape of the area of the tie material which is exposed at the back of the tie at the crossing point;

Fig. 5 is a front view showing the parts at the completion of the wrapping movement;

Fig. 5[a] is a diagram illustrative of the shape of the exposed element of the tie at the front of the knot;

Fig. 5[b] is a diagrammatic section substantially on the line 5[b]—5[b] of Fig. 5;

Fig. 6 is a perspective view showing a further step in the knot formation;

Fig. 6[a] is a diagrammatic view illustrative of the contour of the portion of the tie material which extends from the exposed front member of the knot up and across the back of the knot;

Fig. 7 is a fragmentary diagram showing the several areas concerned in the knot formation laid out in succession on the wider end of the tie; and

Fig. 8 is a front elevation showing the knot completed and the tips of the tie in registry.

In knotting a four-in-hand tie the narrow end portion is held taut and substantially straight—the wider end portion being wrapped about this straight narrow end portion in forming the knot. Thus the length of material taken up in knot formation is substantially all subtracted from the length of the wider end portion. Hence if it can be determined what length of material is taken up in forming the knot, then by laying off this length from the tip of the wider portion of the tie, providing a mark to denote this length, and then disposing the tip of the narrow end portion at this mark on the wider portion preparatory to tying, the two ends should substantially register when the knot is completed.

While this length of material so used in forming the knot may be determined empirically (for example by the manufacturer with respect to each lot of ties of a given style and material) it may be obtained by the following method with sufficient approximation for the usual materials employed in tie manufacture.

In the followng description, wherein reference is made to the annexed drawings, that portion of the tie which embraces the collar is referred to as the neckband portion C; that portion of the wider end W of the tie which is used in knot formation is referred to as the tying portion and designated K, this part being of slowly increasing width, and the narrower end portion of the tie is designated N.

The first step in forming the knot is indicated in Fig. 2, it being assumed that the portion C of the tie has been looped about the collar, the narrow end K being held substantially straight and taut and the part N of the wider portion W has been crossed over in front of the narrow end portion. This crossing of the parts defines a figure (Fig. 2[a]) (approximately a trapesium) in which the distance between sides *a* and *c* rep-

resents the width w of that portion of the part N which is embraced in the knot.

The second step in knot formation is to swing the portion W through an arc of 360° (Figs. 3, 4 and 5), wrapping it completely around the part K. During the first 180° of such wrapping movement (Fig. 3), the material of part K wraps around the edge of the part N (Fig. 3ª), thus taking up a length 2 of the part K which is approximately one-half the circumference of a circle whose diameter is the thickness t of the material N, that is to say, approximately 3/2 t.

As the material of the part K is thus wrapped around, it passes in back of the part N (Fig. 3) and at the crossing point defines an area 3 (Fig. 4ª) of more or less trapezoidal contour. The narrow base k of this figure substantially equals the width of the material N while its upper base l is found to be approximately one and one-quarter times the length of the lower base, that is to say, $1\frac{1}{4}k$. The average length of this figure is thus approximately $1\frac{1}{8}m$.

As the material of the part K completes its wrapping movement, it embraces the edge of the part N and also the edge of the first lap of the part K (Fig. 5ᵇ), thus taking up a length 4 constituting a semi-circumference whose diameter is twice the thickness t of the material, this length therefore being approximately three times the thickness or $3t$. In completing this first wrap of 360°, the material of the part K is extended across and forms the exposed member portion 5 of the knot (Fig. 5ª), this material being of trapezoidal contour whose base s approximately equals the width of the part N and whose upper base q is found to be approximately twice the width of the part N, its average length thus being approximately $1\frac{1}{2}w$.

The next step in forming the knot is to carry the end portion K upwardly (Fig. 6) and in back of the previously formed portions of the knot and so as to extend upwardly beyond the crotch z formed by the first crossing of the parts K and N. The material of the part K which is taken up in this last-named operation is found to form a trapezoidal area 6 (Fig. 6ª) whose average height is approximately three and one-half times the width of the part N, that is to say, $3\frac{1}{2}w$.

The knot is now completed by tucking the tip of the wide end W down behind the front member 6 and pulling it downwardly. The several sections of material above referred to as taking part in knot formation are indicated in series in Fig. 7 and it is evident that the sum of these several sections equals the total length of material which is subtracted from the part K in forming the knot.

For most ties the thickness t of the parts K and N is approximately $\frac{1}{8}$ inch and the width w of that portion of part N which is embraced in the knot is approximately $\frac{7}{8}$ of an inch.

While the above dimensions are approximate, they are sufficiently accurate for the purpose and it will be noted that if the several sections indicated in Fig. 7 are added the sum

$$w+1\frac{1}{2}t+1\frac{1}{8}w+3t+1\frac{1}{2}w+3\frac{1}{2}$$

equals $6\frac{1}{2}$ inches approximately. Stated in terms of a general formula, whose variables are w and t, the distance D from the tip T to the index element may be in accordance with the expression $D=7\frac{1}{8}w+4\frac{1}{2}t$, it being understood that by reason of slight variations in style or material, this distance is approximate but within a range which is sufficiently accurate for the intended purpose.

Having ascertained this distance by following the formula just above indicated, and with reference to the particular values of w and t as related to the material employed and the style of tie to be made, the manufacturer then measures upwardly from the tip T (Fig. 1) of the tie a distance which in the specific instance above indicated would be $6\frac{1}{2}$ inches approximately, and places any suitable index means at this point, for instance, a distinctively colored thread may be stitched into the rear ply of the tie or a piece of tape P or a button may be sewed on.

When the tie is to be worn, it is placed about the neck in the usual way and the ends are relatively adjusted until the tip Z of the narrow end of the tie is registered with the index element P. The user then ties the knot in the ordinary way, and when the knot is completed, it will be found that the tips M and T are substantially registered with each other, thus providing the desirable esthetic effect which is ordinarily obtained only by the exercise of great care and often repeated trials on the part of the user.

While one desirable embodiment of the invention has herein been illustrated by way of example, it is to be understood that the invention is not to be limited to the precise arrangements suggested but is to be regarded as broadly inclusive of the subject matter of the appended claim.

I claim:

A necktie having a wide end and a narrow end, and a neckband connecting the two, and an index element on the rear ply of the wide end located at a distance from the free end thereof substantially equal to the aggregate length of the material used in forming the four-in-hand knot.

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