United States Patent

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[15] **3,661,106**

[45] **May 9, 1972**

[54] GARMENT PARTS WITH DETECTABLE STITCHING

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[22] Filed: **Aug. 21, 1969**

[21] Appl. No.: **851,921**

[52] **U.S. Cl.**.....**112/262,** 112/121.27, 112/130, 83/365, 250/71.5

[51] **Int. Cl.**.....**D05b 1/00,** D05b 23/00

[58] **Field of Search**.....112/121.27, 121.26, 121.25, 112/131, 130, 42, 43, 262, 252; 2/243, 274, 275; 250/52, 71, 83, 71.5; 83/72, 365; 57/140 C, 153; 40/1; 106/21; 66/1

[56] **References Cited**

UNITED STATES PATENTS

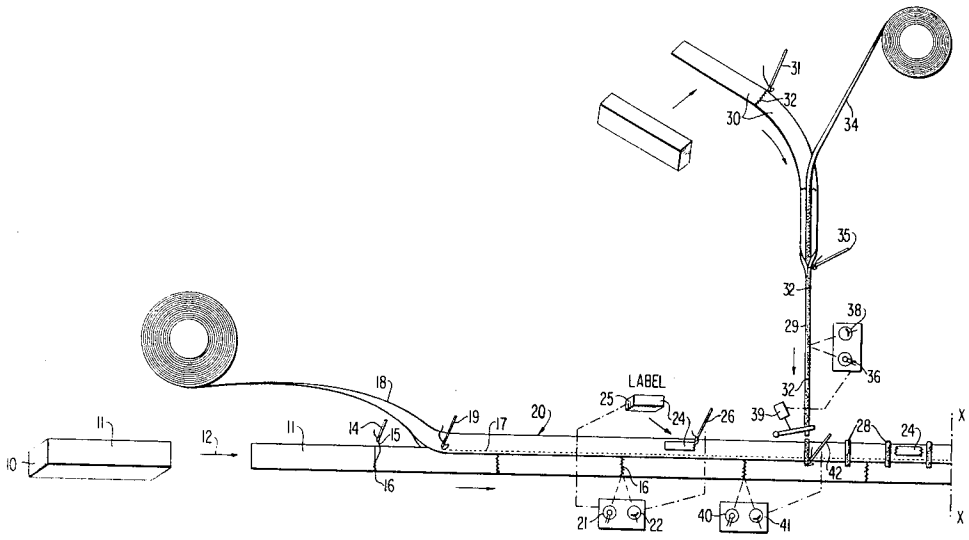
2,410,336	10/1946	Carter et al.	112/43 X
2,469,961	5/1949	Gottschalck	250/71 X
2,746,412	5/1956	Roseman	112/262
3,027,830	4/1962	Yaeger	250/71
3,133,466	5/1964	Seifert	83/365 X
3,484,098	12/1969	Ramsey et al.	83/365 X
2,089,413	8/1937	Paine et al.	106/21
2,180,508	11/1939	Fraine et al.	40/1 X
2,388,648	11/1948	Sheppard	66/1 R

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[57] **ABSTRACT**

Garments are formed with stitching which carries a substance detectable when illuminated by ultra-violet light. When the stitching is detected in a process of making garments, subsequent garment making steps are actuated in response to the detection of the stitching.

4 Claims, 1 Drawing Figure



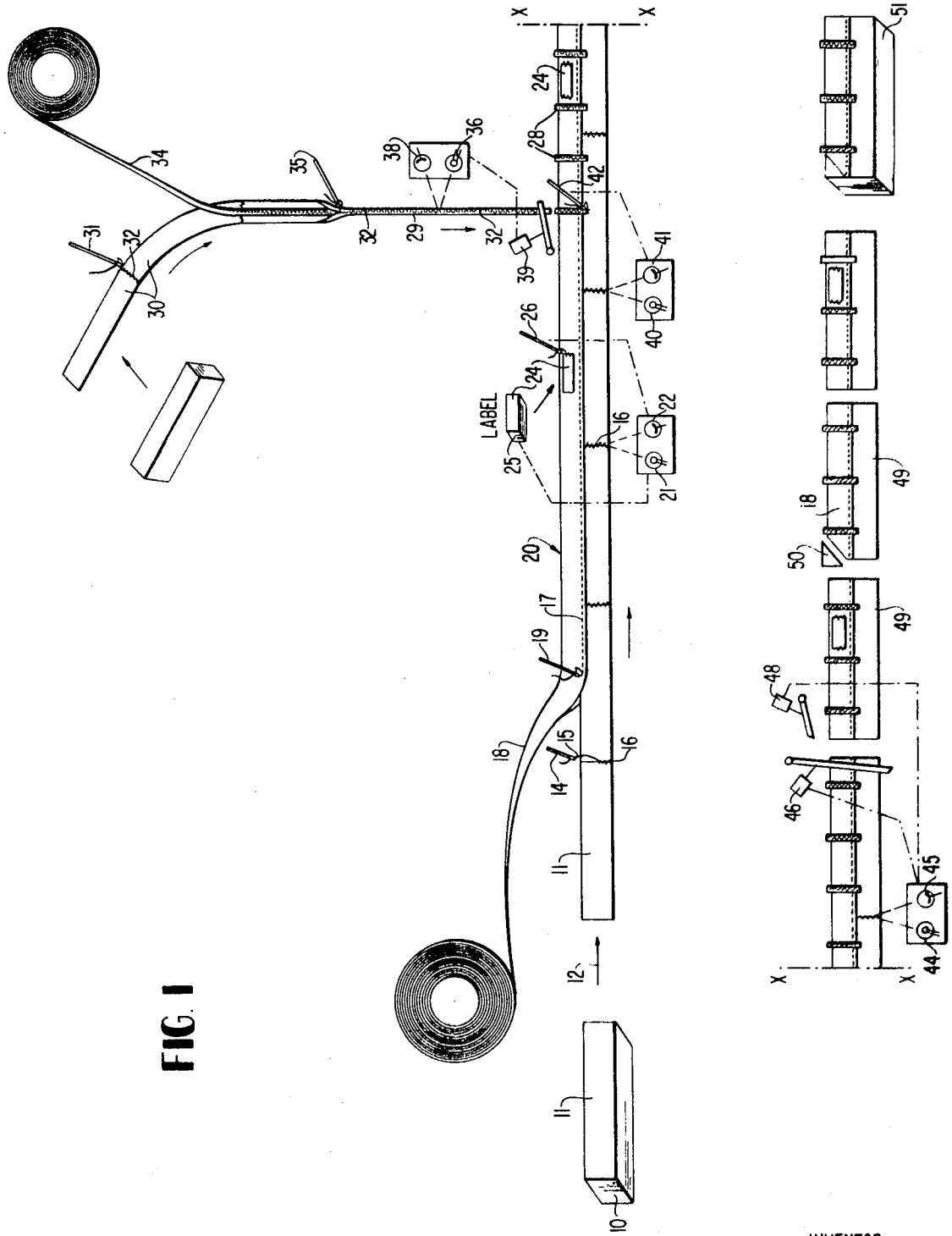


FIG. 1

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GARMENT PARTS WITH DETECTABLE STITCHING

BACKGROUND OF THE INVENTION

In the fabrication of clothing apparel and other similar products, various steps must be performed on the garment parts, such as cutting away a portion of a garment part, or connecting various garment parts together. These steps must be precisely performed so that the garment parts are properly cut, folded, stitched or connected together to properly form the finished garment.

In the past, virtually all of the steps in forming a garment have been performed by hand. More recently, various machines have been utilized to assist the worker in the fabrication of garments and to speed up the garment fabricating process. The development of sewing machines, conveyors, fabric folders, stackers, and switches and electric eyes to actuate and deactuate the various machines have come into common use. However, even with the use of the many machines recently developed in the garment fabricating industry a large percentage of the movement and placement of garments parts with respect to the various machines is still being carried out by hand. The skill of the machine operator is still required to properly position garment parts for stitching, cutting, etc., since no reliable detecting or switching mechanism has been developed to perform these functions. While electric eyes and micro-switches have been developed for the detection of garment parts and the actuation of sewing and cutting machines in response to the detection of a garment part, many of the garment fabricating functions performed do not depend on the mere presence or absence of garment parts as might be detected by electric eyes or micro-switches. For instance, the placement of belt loops on waistbands and the cutting of material are usually performed by operators that orient the garment parts and connect, fold or cut the garment parts with knowledge of what the end-product will look like and how the garment parts must be treated in order to create the finished product.

SUMMARY OF THE INVENTION

Briefly described, the present invention comprises a garment part which carries a stitching which is detectable when subjected to ultra-violet light. The stitching is used as a reference point on the garment part so that when it is detected various garment making steps will be actuated such as cutting, folding, stitching, and positioning garment parts together. The garment part carrying such a stitching is moved along a path through a garment making process, and the various garment making steps are actuated at various points along the path by the detection of the stitching. The detectable stitching can also serve to connect together various pieces of the garments.

Thus, it is an object of this invention to provide a garment part which carries a detectable stitching for the actuation of various garment fabricating steps.

Another object of this invention is to provide a method of making garments which uses a detectable stitching in a garment part to actuate steps in the process.

Another object of this invention is to provide apparatus for detecting particular stitching in garment parts and for performing various garment making processes in response to the detection of such stitching.

Other objects, features, and advantages of the present invention will become apparent upon reading the following specification when taken in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic illustration of a continuous process of making waistbands for pants.

DESCRIPTION OF THE PREFERRED EMBODIMENT

While a process for forming waistbands is disclosed herein, it will be understood by those skilled in the art that the invention can be practiced in various other environments to produce various other products.

Referring now in more detail to the drawing, FIG. 1 illustrates a method of making waistband sections for pants, or the like, in which waistband panels **11** are fed from a stack **10** of waistband panels through a path **12**, and various other garment parts are attached to the waistband panels. Waistband panels **11** are stitched in end-to-end relationship by sewing machine **14**. The thread **15** used by sewing machine **14** is impregnated with an ink which fluoresces under ultra-violet or high energy light rays. The fluorescent ink is of conventional substance and includes phosphorescent metallic salts (calcium tungstate, zinc sulphide, and zinc silicate). Of course, the substance of the fluorescent ink can be varied to provide the desired result, as more fully explained hereinafter.

Sewing machine **14** forms a seam or stitching **16** between garment parts **11**. As the garment parts are moved further along path **12**, a band **18** of facing material is fed into abutting and overlapping relationship with the continuous edge of the series of waistbands panels **11**, and sewing machine **19** forms a rocap seam and connects facing material **18** to the waistband panels **11** to form a continuous strip of waistband material **20**.

As the waistband material moves along path **12**, ultra-violet light **21** illuminates the stitching **16** between waistband panels **11**, and detector **22** detects the presence of stitching **16** and energizes a labeling machine (not shown) which dispenses a label **24** from the stack of labels **25** onto the facing material **18** and begins the sewing of the label **25** with its sewing machine **26**.

As the continuous strip of waistband material **20** moves further along path **12**, belt loops **28** are applied thereto from the continuous strip of belt loop material **29**. The continuous strip of belt loop material **29** is fabricated from belt loop panels **30** which were previously cut from the same material as waistband panels **11**. Belt loop panels **30** are tacked by sewing machine **31** in end-to-end relationship with a temporary stitch **32**. The thread from which stitching **32** is formed is also impregnated with a fluourescent material. As the belt loop panels are moved toward the path **12** of waistband material **20**, a band of stiffening tape **34** is moved into overlying relationship with belt loop panels **30**, and the belt loop panels **30** are folded over and sewed about stiffening tape **34** with sewing machine **35**. As the belt loop material **29** moves further along its path toward the path of movement of waistband material **20**, ultra-violet light **36** illuminates the material and when a stitching **32** is detected by detector **38**, cutting mechanism **39** is actuated to cut belt loops **28** from the strip of belt loop material **29**. The arrangement of the cutting mechanism **39** is such that the belt loop material **29** will be cut at stitchings **32** and at spaced intervals behind each stitching **32** to form belt loops of a predetermined length.

In the meantime, as waistband material **20** moves further along its path **12**, ultra-violet light **40** illuminates stitchings **16**, and detector **41** detects the presence of stitching **16** to control the feeding of belt loop material **29** and the belt loops **28** cut therefrom into overlying relationship with waistband material **20**. Sewing machine **42** is also controlled by detector **41**, and sewing machine **42** stitches belt loops **28** to waistband panels **11**, as shown.

After belt loops **28** have been attached to waistband material **20**, ultra-violet light **44** again illuminates waistband material **20**, and detector **45** senses the presence of the stitchings **16** to actuate cutting mechanism **46** and **48** which cut both facing material **18** and the stitching between waistband panels **11** to form completed waistband sections **49**. Cutting mechanism **46** functions to cut straight across waistband material **20** and stitchings **16**, while cutting mechanism **48** is actuated upon the sensing of alternate ones of stitchings **16** to cut alternate waistband sections **49** with a slanted cut to remove a portion **50** of the band of facing material **18** away from alternate ones of the waistband sections **49**.

At this point, waistband sections **49** are separately formed and are placed in a stack **51** where they can be processed in an

orderly manner to another station and connected to the pant legs, etc.

In order to facilitate subsequent folding, cutting and stitching functions necessary in the completion of the garment, rocap seam formed by sewing machine **19** can also be formed with fluorescent thread, and the stitching performed by sewing machine **42** in attaching belt loops **28** to waistband panels **11** can be of fluorescent thread. The use of the fluorescent thread enables subsequent machines to sense the presence of the stitching formed by the thread, and fold, cut and stitch these garment parts, as may be desired, and reduce the number of manual steps that must be performed by a machine operator.

While an ultra-violet light and detector device have been disclosed for actuating the operation of each device, it should be understood that one illuminating and/or detecting apparatus can be utilized to control the operation of several devices. For instance, a single ultra-violet light source can be utilized to illuminate a long length of waistband material **20** and several detectors can be spaced along the path of the waistband material at the locations at which the detection of a seam **16** is desired. Furthermore, the detection of a seam **16** at one location can be utilized to trigger both the beginning of one stitching or cutting function and to trigger a time delay device which ultimately actuates a subsequent function. As long as the waistband panels **11** are of uniform length and there are no variables in the system, a single detection of stitching **16** can control all the subsequent stitching, cutting, and placement in the process which is dependent upon the location of stitching **16**.

It should be noted that the stitching formed with thread coated with fluorescent material in the process is located in portions of the garment parts that will normally not be exposed in the completed garment. Thus, when the garment parts are made in this manner the fluorescent material does not have to be removed from the garment before the garment is sold. Furthermore, the visible color of the thread normally will be matched with the color of the garment part and the fluorescent material with which the threads are impregnated is washable, so that the fluorescent material can be washed from the garment before its sale, if desired. Moreover, since the fluorescent material does not fluoresce and is not visible under normal lighting conditions and will not be exposed to ultra-violet light during the normal use of most garments, the material usually will not be noticed when it appears on the external surface of the garment.

While the disclosed process has been broadly set forth in schematic form, the various machines utilized to perform the process are substantially conventional, and for the most part, are available on the market place. For instance, the sewing machines utilized to form the stitches, the cutting devices utilized to cut the belt loops and to cut the band of facing material are substantially conventional, with only their particular arrangement and association with each other in the environment of the disclosed process being novel. Ultra-violet lights are available on the market place, and detectors sensitive to ultra-violet lights can also be purchased.

While the invention has been disclosed as an automatic process, it should be understood that many of the steps set forth in the process can be performed by hand. The sewing machines can be actuated and otherwise operated by hand, the fluorescent stitching can be detected by a machine operator, and the cutting devices can also be hand operated. The fluorescent stitching would aid the machine operator to more readily detect the location of the stitching, to more accurately and rapidly perform the stitching, folding and placement functions.

While the invention has been set forth in connection with the fabrication of waistband sections for pants, or the like, it will be understood by those skilled in the art that the various detecting, cutting, stitching, folding, and placement steps can be carried out on different garment parts or in relation with other textile goods, and the invention disclosed herein is not limited to the fabrication of waistband sections. Thus, while this invention has been described in detail with particular reference to preferred embodiments thereof, it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinbefore and as defined in the appended claims.

I claim:

1. In a method of making garments or the like, the improvement comprising the steps of sewing together garment parts with a stitching of thread which visibly contrasts with the garment parts when illuminated by ultraviolet light, moving the garment parts along a predetermined path, illuminating the stitching in the garment parts with ultra-violet light at a predetermined position along the path, detecting the illuminated stitching, and attaching another garment part to one of the first mentioned garment parts at a position on the garment part spaced from the detected stitching in response to detecting the stitching.

2. In a method of making waistbands or the like the improvement comprising sewing a series of waistband panels in end-to-end relationship with a thread which carries a substance which visibly contrasts with the waistband panels when illuminated with ultra-violet light to form a continuous series of waistband panels, rocaping a continuous strip of facing material to an edge of the continuous series of waistband panels to form a continuous strip of waistband sections, progressively illuminating the continuous strip of waistband sections with ultra-violet light, detecting the thread, and attaching belt loops or the like to the waistband panels in response to the detection of the thread at positions spaced from the location of the detected thread.

3. A method of forming garments or the like comprising joining together a plurality of similar garment parts with a stitching of mechanically detectable thread to form a series of connected garment parts, moving the connected series of garment parts along a predetermined path, mechanically detecting the stitching as the stitching moves with the series of garment parts past a predetermined position along the path, and performing another garment-making step on the series of garment parts in response to the detection of the stitching at another position spaced from the predetermined position along the path.

4. In a method of making garments or the like, the improvement comprising the steps of sewing together garment parts with a stitching of thread which is mechanically detectable with respect to the garment parts, moving the garment parts along a predetermined path, mechanically detecting the mechanically detectable stitching at a predetermined position along the path as the garment parts move along the path, and performing another garment-making step on the garment parts at another position along the path which is spaced from the predetermined position along the path in response to detecting the stitching at the predetermined position along the path.

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