Patentability Search Report

Jig for Ultrasonic Cutting of V-loop Waist Band and method of manufacturing the Waist Band of undergarment

(Docket No: **LEX065P002**)

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Contents

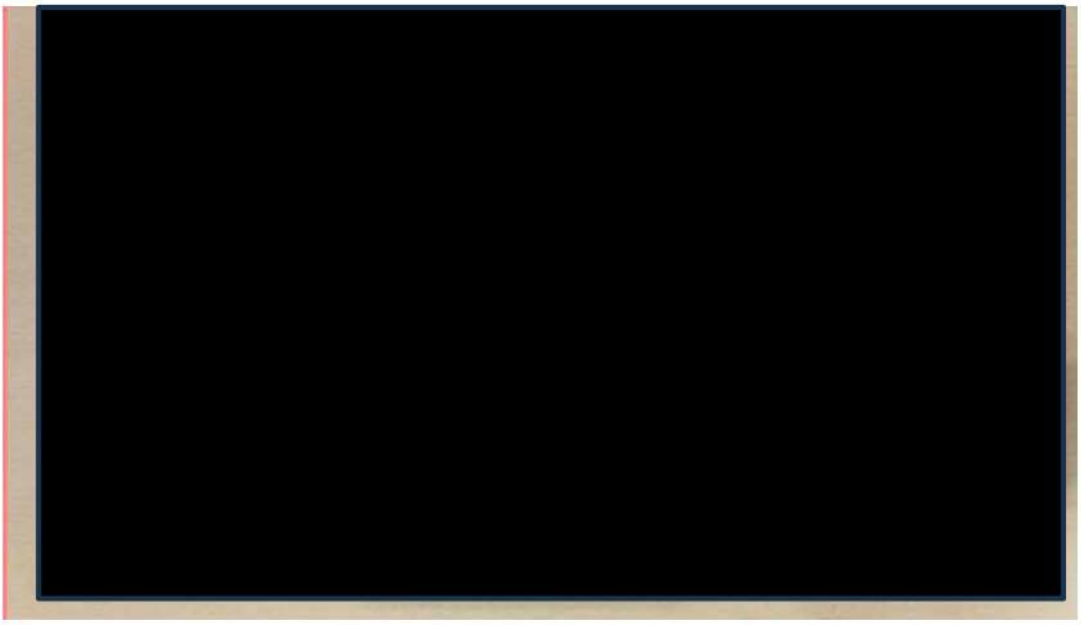
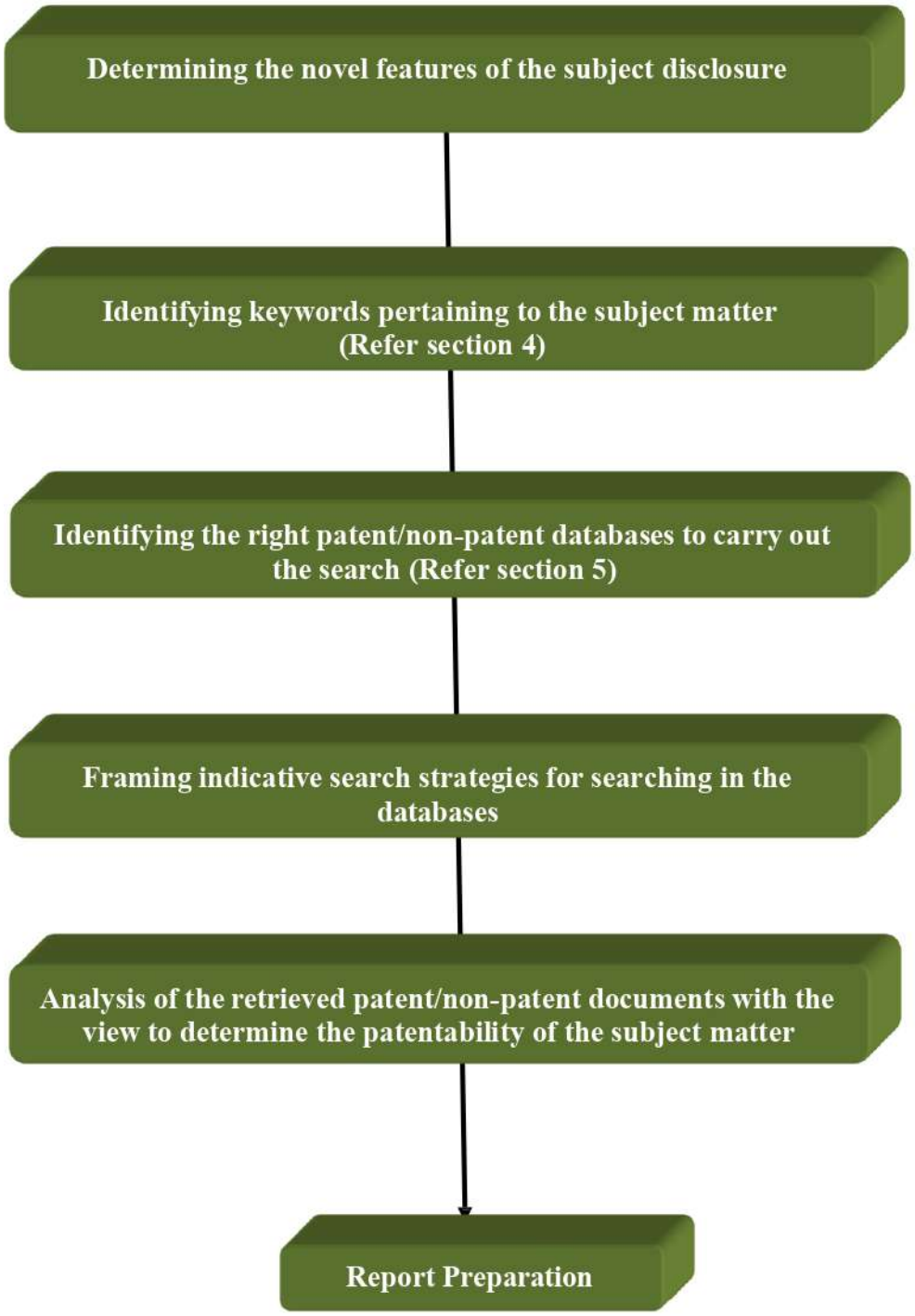


FIG .1

4. Research Methodology

The following search methodology was adopted for finding relevant prior art documents:



5. Databases Used

Patent Databases

- ❑ IP.COM
- ❑ QUESTAL ORBIT
- ❑ DERWENT INNOVATION
- ❑ USPTO
- ❑ ESPACENET
- ❑ WIPO
- ❑ JPO
- ❑ KPO
- ❑ GOOGLE PATENTS
- ❑ PATENT LENS
- ❑ SUMOBRAIN
- ❑ FREE PATENT ONLINE
- ❑ DEPATISNET

Non-Patent Databases

- ❑ SCIENCE DIRECT
- ❑ GOOGLE SCHOLAR
- ❑ IEEE XPLORE
- ❑ FREEFULL PDF

6. Key Features

Key features of the subject considered for the patentability search are listed below.

Feature No.	Key Features
1	A jig for securing and positioning an elastic material for ultrasonic cutting.
2	The jig comprises [redacted]
3	[redacted]
4	[redacted]
5	[redacted]
6	[redacted]
7	[redacted]

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the opposite side of the ultrasonic oscillator with the fabric fabric interposed therebetween to press the fabric fabric; And a cutting part disposed between the jig and the ultrasonic oscillation part to cut the press fabric.

The said cutting part can be fixed to the said jig | tool.

The ultrasonic oscillation unit may be disposed below the fabric fabric, and **the jig may be disposed above the fabric fabric.**

The one or more fabric fixing portion, the first fixing portion which is disposed in front of the jig along the direction of progress of the fabric fabric; And a second fixing part disposed behind the jig;

The jig 150 is disposed on the opposite side of the ultrasonic oscillator 260 with the fabric fabric 110 interposed therebetween to press the fabric fabric 110 under the control of the controller 250 to be described later. That is**, the jig 150 is fixed to the jig fixing part 160 through the jig connector 155**, the jig fixing part 160 is connected to the jig drive cylinder 265 fixed to the main body. The jig drive cylinder 265 moves the piston 267 vertically forward and backward under the control of the controller 250, and the vertical movement of the jig fixing part 160 is guided by the jig guide pillar 162. . Accordingly, as the controller 250 controls the jig driving cylinder 265, **the jig 150 may operate vertically to press the fabric fabric 110.**

The cutting part 300 is fixed to the jig 150 (see FIG. 3). Therefore, when **the jig 150 advances downward to press the fabric fabric 110, the fabric fabric 110 is cut by the cutting part 300.**

Fabric cutting method using the ultrasonic wave according to the present invention for achieving the above technical problem, a fabric cutting method for cutting the fabric fabric using the ultrasonic wave, the preparation step of preparing the fabric fabric; **Disposing the fabric between the fixed jig and the ultrasonic oscillation unit generating ultrasonic vibration; And a cutting step of applying the ultrasonic vibration to the fabric fabric while pressing the fabric fabric by the jig.**

Non-Patented Literature

Result No.	NPL Title
Result 3	Ultrasonic strap cutter bonding machine
Result 4	Cambodian girls use an ultrasound machine to weld elastic bands
Result 5	Empenzo Ultrasonic Elastic Joining Machines

Result 3:

Title	Ultrasonic strap cutter bonding machine
Author/Owner	Sophie Xiao
Published:	21 May 2019

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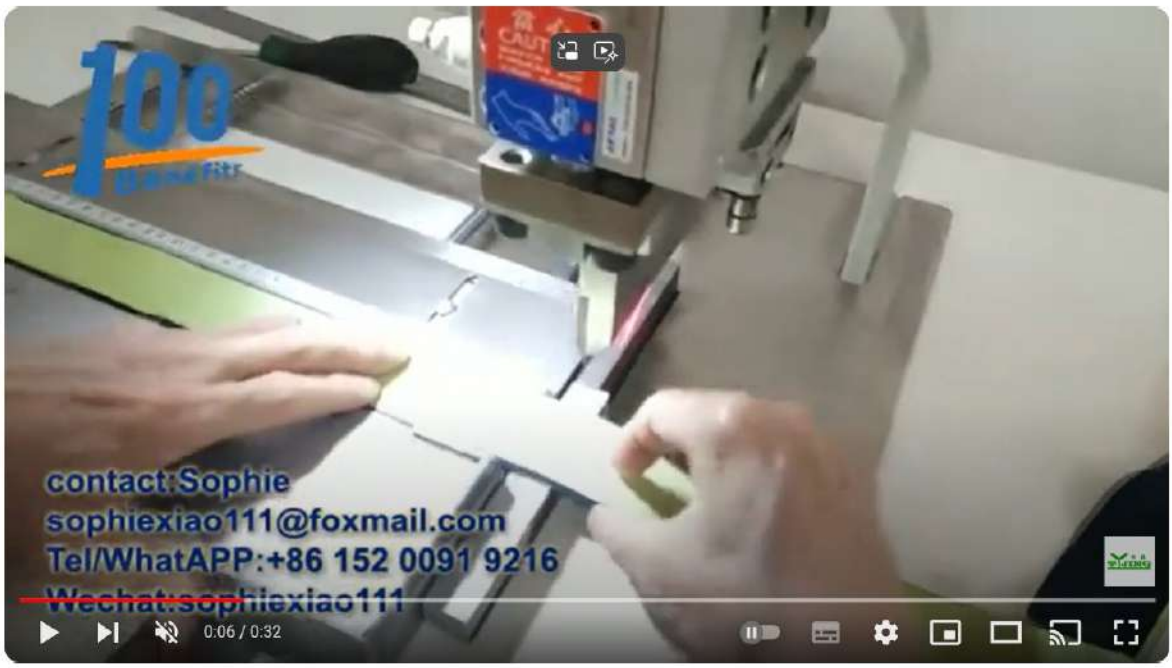
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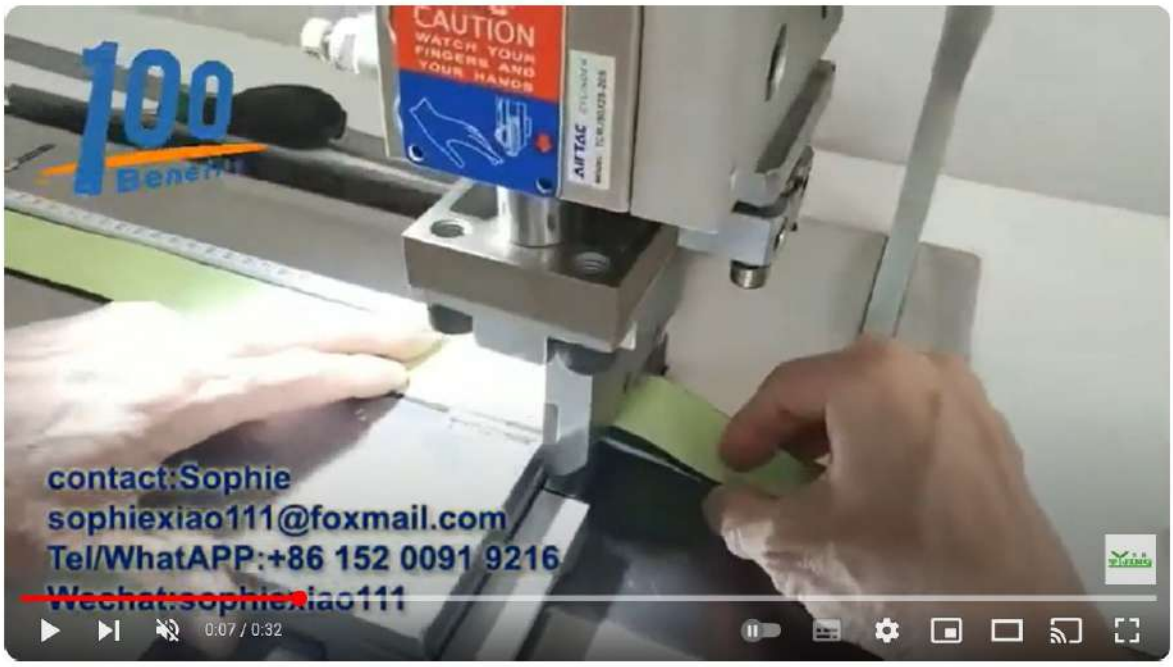
CAUTION
WATCH YOUR FINGERS AND YOUR HANDS
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sophiexiao111@foxmail.com
Tel/WhatAPP:+86 152 0091 9216
Wechat:sophiexiao111
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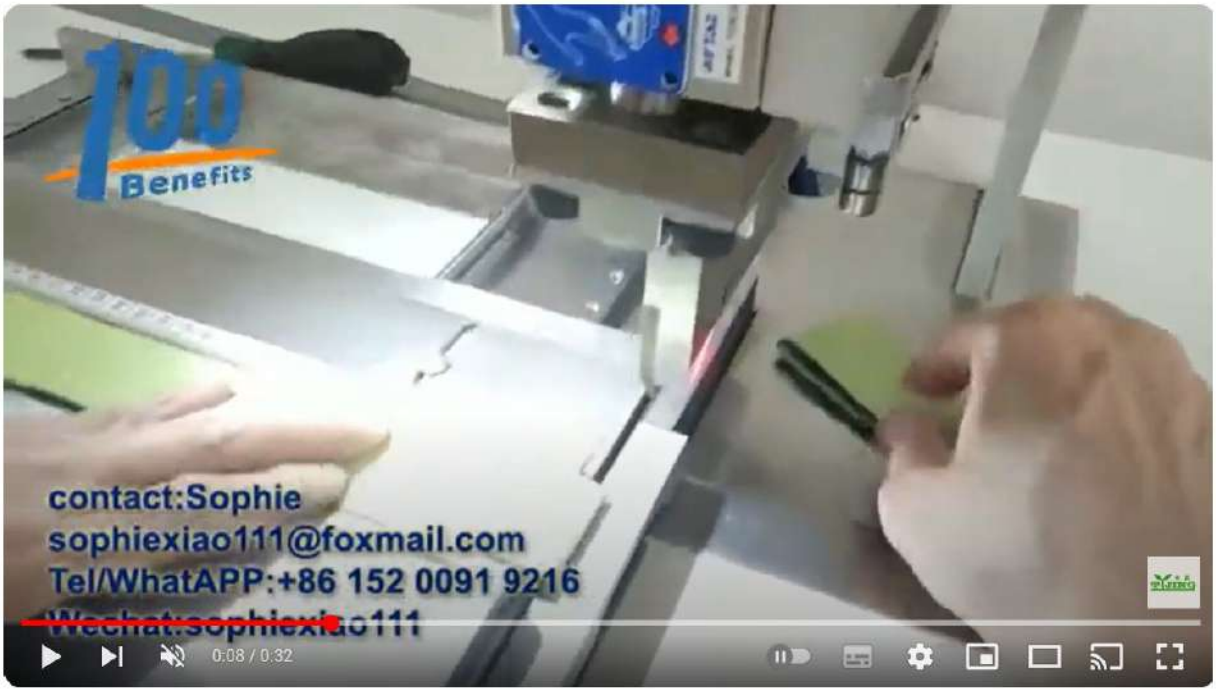

The video shows an ultrasonic strap cutter being used to cut and bond the elastic band for short pants simultaneously. Additionally, a custom ruler is featured to measure the size of the elastic band accurately. This process ensures precise cutting and bonding, making it efficient for manufacturing clothing items like short pants. The use of ultrasonic technology allows for clean, strong bonds without the need for additional stitching or adhesives.

Result 4:

Title	Cambodian girls use an ultrasound machine to weld elastic bands
Author/Owner	DONGGUAN KAILONG High frequency MACHINE
Published:	9th Jan 2021

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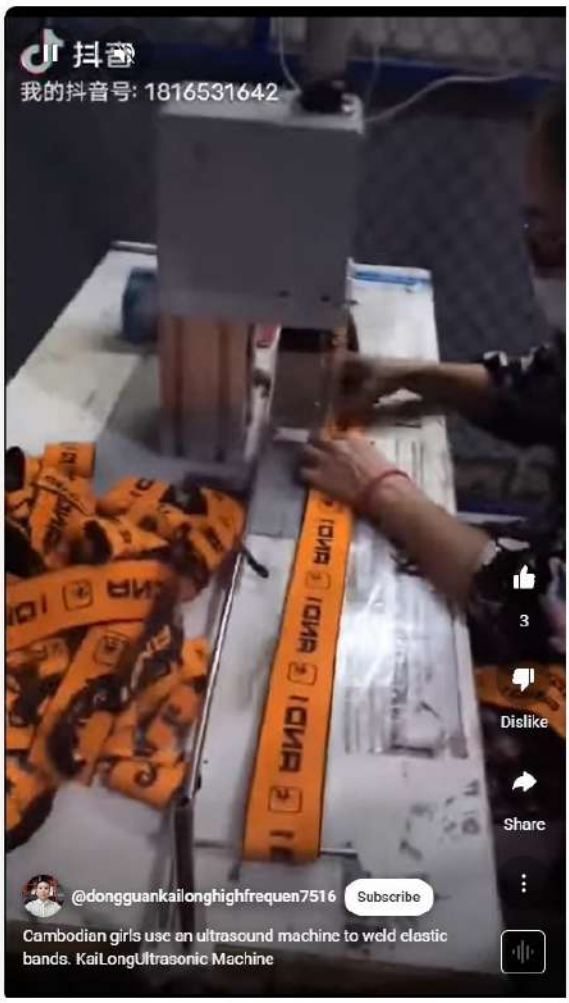

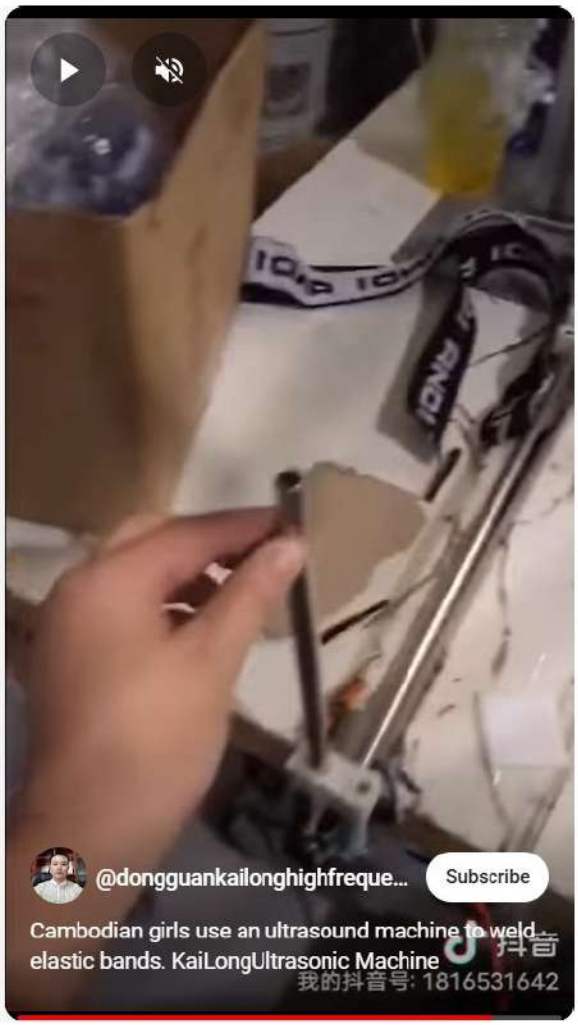

The video features Cambodian girls using an ultrasonic machine to weld elastic bands. The machine, likely from the brand KaiLong, uses high-frequency sound waves to fuse the bands together without heat. The video showcases the efficiency of the ultrasonic welding process in creating secure bonds in elastic materials.

Result 5:

Title	Empenzo Ultrasonic Elastic Joining Machines
Author/Owner	Empenzo
Published:	20 Mar 2021

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The video describes a demonstration of an ultrasonic strap cutter being used to cut and bond elastic bands. The process is shown in detail, highlighting the precision and clean results of the cuts. The speaker in the video mentions how the elastic band is measured, aligned, and then cut seamlessly by the machine. They also note how difficult it is to see the cut point due to the quality of the bonding, emphasizing the effectiveness of the ultrasonic technology.

[redacted]

Overall, while the prior art includes a variety of jigs tailored to different requirements and industries, the specific design and features of the jig in the disclosure appear to be novel and not covered by existing solutions.

9. Disclaimer

LexAnalytico has prepared this report based on database and information sources that are believed to be reliable. We disclaim all warranties as to the accuracy, completeness, or adequacy of such information. The patentability search is performed for all published patent and non-patent literature and for all jurisdictions covered by reliable patent and non-patent databases. The above report is prepared based on the search conducted on the keywords and other information extracted from the invention disclosure and subjectivity of the researcher and analyst. The analyst is not intending to provide legal advice in this matter.

1. Search Objective

To conduct a patentability search on the subject matter disclosed in the invention disclosure titled "Jig for Ultrasonic Cutting of V-loop Waist Band and method of manufacturing the Waist Band of undergarment".

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2. Background Information of the Subject Matter

In the garment manufacturing industry, particularly in the production of undergarments like boxers and briefs, the incorporation of elastic materials is crucial for ensuring comfort, fit, and functionality. Elastic materials, such as stretchable bands or textile elastics, are used primarily for waistbands to provide a snug yet flexible fit. These materials are typically produced in various widths, ranging from 20mm to 50mm, to accommodate different garment designs and sizes. The precision in cutting these elastic materials is essential for maintaining the quality and uniformity of the final product. Inaccurate cuts can lead to defects such as uneven waistbands, misaligned seams, or reduced elasticity, which adversely affects the fit and comfort of the garment.

Ultrasonic cutting is a technique that utilizes high-frequency ultrasonic vibrations to cut materials. This technology offers several advantages over traditional cutting methods, such as increased precision, reduced material wastage, and minimized heat damage. Ultrasonic cutting is particularly beneficial for elastic materials as it can cut through the material without causing fraying or stretching, which is crucial for maintaining the integrity of the elastic properties. However, the effectiveness of ultrasonic cutting is heavily dependent on the accurate positioning and securing of the material. Inconsistent alignment or movement of the elastic during cutting can result in imperfections and defects. Thus, ensuring precise placement and stable holding of the elastic material is a significant challenge.

3. Understanding of Subject Matter

A jig as shown in FIG. 1 for securing and positioning an elastic material for ultrasonic cutting. [redacted]

7. Related Search Results

Patented Literature

Result No.	Patent Title
Result 1	Cutting apparatus for woven fabrics and cutting method using supersonic wave
Result 2	Ultrasonic cutting system with protective sheet

Result 1:

Application Number	KR100829990B1
Title	Cutting apparatus for woven fabrics and cutting method using supersonic wave
Applicant	PARK SANG BOO
Filing Date	2006-10-31

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Abstract

An apparatus and a method for cutting a textile fabric are provided to finish an edge portion of a textile product cleanly, by cutting the textile fabric with ultrasonic waves. A fabric-feeding unit(170) feeds a textile fabric(110). An ultrasonic wave generator(260) generates ultrasonic vibration energy, and transmits the ultrasonic vibration energy to the textile fabric. A jig(150) is disposed on the opposite side of the ultrasonic wave generator with the textile fabric therebetween. The jig pressurizes the textile fabric. A cutting unit is disposed between the jig and the ultrasonic wave generator to cut the pressurized textile fabric. The cutting unit is fixed to the jig. Further, the ultrasonic wave generator is at a lower part of the textile fabric and the jig is at an upper part of the textile fabric.

Cited Portion

Description:

Fabric cutting device using the ultrasonic wave in accordance with the present invention to achieve the technical problem, the fabric supply unit for supplying the fabric fabric; An ultrasonic oscillator for generating ultrasonic vibration energy and transmitting the ultrasonic vibration energy to the fabric fabric supplied from the fabric supply unit; **A jig disposed on**

Result 2:

Application Number	US20040079208A1
Title	Ultrasonic cutting system with protective sheet
Applicant	RayMedica LLC
Filing Date	2002-10-25

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Abstract

The present invention relates to an ultrasonic cutting system including a protective sheet for protecting a cutting blade. The ultrasonic cutting system includes an ultrasonic cutting device, a base plate, and a protective device. The ultrasonic cutting device is configured to cut a material and includes a cutting blade. The base plate is configured to support the material during interaction with the cutting blade. The protective device includes a protective sheet routed over the base plate. During use of the ultrasonic cutting system, the material is routed over the protective sheet prior to interaction with the cutting blade, and the protective sheet is configured to decrease contact between the cutting blade and the base plate.

Cited Portion

Claims

1. An ultrasonic cutting system comprising:

an ultrasonic cutting device configured to cut a material, the ultrasonic cutting device including a cutting blade;

a base plate configured to support a material during interaction with the cutting blade; and

a protective device including a protective sheet routed over the base plate, wherein during use the material is routed over the protective sheet prior to interaction with the cutting blade, the protective sheet being configured to decrease contact between the cutting blade and the base plate during use.

2. The ultrasonic cutting system of claim 1, further comprising:

a first clamp connected to the base plate, the first clamp configured to selectively retain the material against the base plate; and

a second clamp spaced from the first clamp, the second clamp being connected to the base plate and configured to selectively retain the material against the base plate;

wherein the ultrasonic cutting blade is positioned between the first clamp and the second clamp.

8. Conclusion

In reviewing the prior art related to jigs for ultrasonic cutting, we have encountered a variety of jigs tailored to meet specific requirements across different industries and technical needs. These include industry-specific jigs designed for textiles, automotive components, and electronics, each addressing the unique challenges posed by the materials and cutting processes involved. Additionally, technical specifications such as material characteristics and the type of cutting tools used influence the design of these jigs. For instance, jigs may be customized to handle materials with varying properties or to align with specific operational parameters of the cutting tools. Moreover, jigs are often adapted to accommodate different levels of user expertise, ranging from simple manual jigs to more complex automated systems.

However, we have not found any prior art that specifically matches the unique features of the jig described in the current invention.