June 17, 1969 U. M. BRIDGEMAN 3,450,075

APPARATUS FOR CLOSING THE TOE PORTION OF CIRCULAR KNIT HOSIERY

Filed July 7, 1967

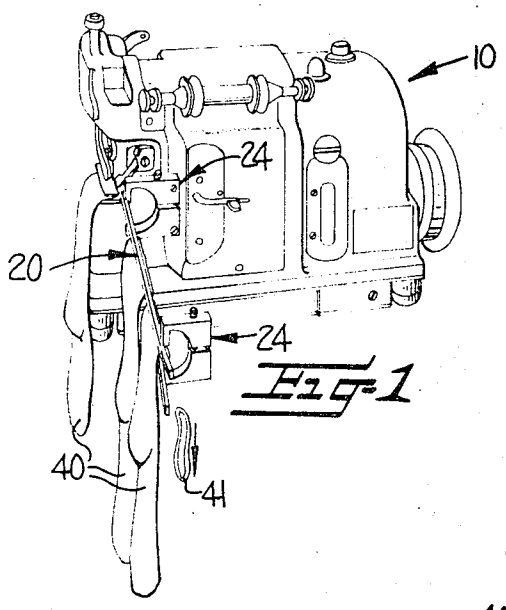


Fig-1

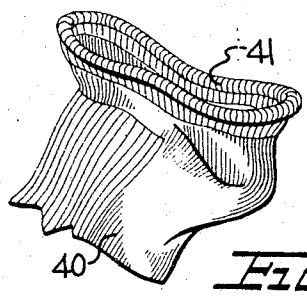


Fig-5

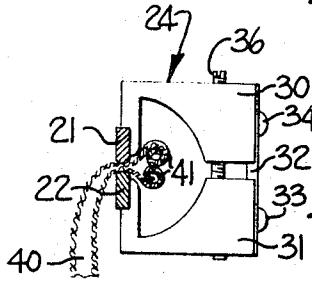


Fig-6

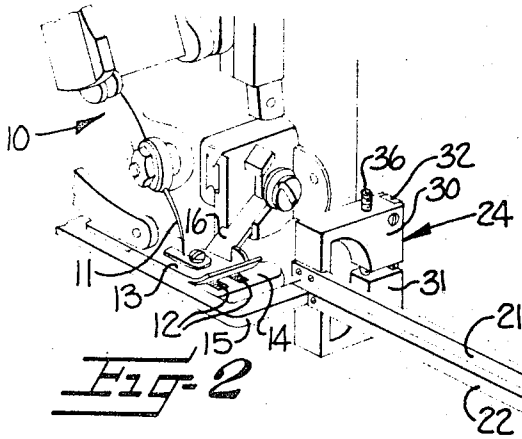


Fig-2

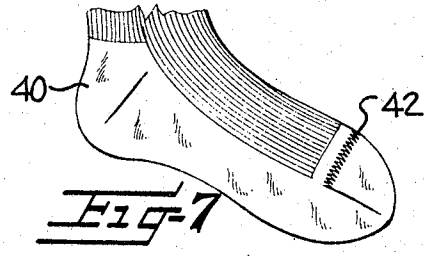
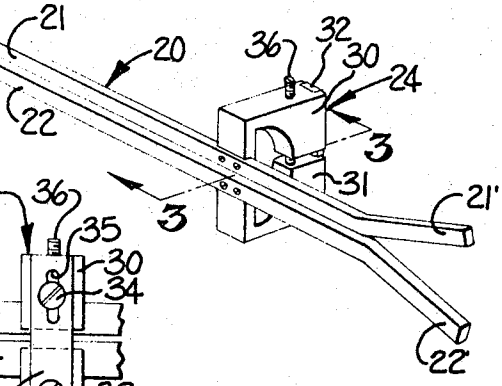


Fig-7



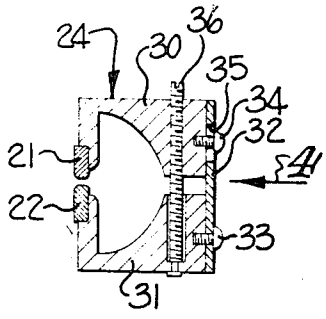


Fig-3

Fig-4

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APPARATUS FOR CLOSING THE TOE PORTION OF CIRCULAR KNIT HOSIERY

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U.S. Cl. 112—27 3 Claims

ABSTRACT OF THE DISCLOSURE

A guiding and aligning means in an overedge sewing machine, adapted for use with circular knit hosiery having an increased thickness looper portion, comprising spaced apart arms adapted to receive the toe portion of circular knit hosiery and allow easy alignment of the superimposed edges thereof and easy guiding thereof into the overedge sewing machine for cutting off the looper portion and closing the toe portion by overedge stitching.

This invention relates to an aligning and guiding means used in an overedge sewing machine for closing the toe portion of circular knit hosiery and more particularly a guide and aligning means specifically adapted for use with circular knit hosiery having increased thickness looper portion.

Heretofore and for many years, the toe portions of circular knit hosiery have been usually closed by a looping operation which involved manually impaling individual loops of the hosiery upon points of a looping machine. This looping operation is necessarily costly and time-consuming, and requires the use of highly-skilled operators.

Because of the high cost involved and the degree of skill necessary by an operator, attempts have been made to close the toe portion of circular knit hosiery by overedge sewing machines. However, because of the non-uniformity obtained in manually aligning and guiding the superimposed edges of the toe portion of the circular knit hosiery into and through and overedge sewing machine, these overedge sewing operations for closing the toe portions of circular knit hosiery have not proved entirely satisfactory and have resulted in inferior quality goods.

Therefore, it is an object of this invention to provide a guiding and aligning means for use with an overedge sewing machine to allow an operator to easily align and guide the toe portion of circular knit hosiery into and through the overedge sewing machine for closing the toe portion of such circular knit hosiery. The use of this guiding and aligning means in an overedge sewing machine will provide continuity in the toe closures and acceptable toe closures for the hosiery and, therefore, eliminate the necessity for the expensive and time-consuming looping operation heretofore necessary for acceptable toe closures in the circular knit hosiery.

By this invention, it has been found that the object may be accomplished by providing a guiding and aligning means in an overedge sewing machine which is adapted for use with circular knit hosiery having an increased thickness looper portion and which comprises a pair of elongate, spaced apart, superimposed lower and upper arms carried by the sewing machine and extending in the longitudinal direction of feed of the sewing machine and terminating in close proximity to the needle plate and the presser foot of the sewing machine. The upper and lower arms are spaced apart a sufficient distance to allow passage therebetween of superimposed edges of the toe portion and to prevent passage therethrough of the increased thickness looper portion. The lower arm has the upper surface thereof in the same horizontal plane with the needle plate. This guiding and aligning means allows insertion of the superimposed edges of the toe portion of circular knit hosiery between the arms and easy alignment thereof by pulling the increased thickness looper portion against the sides of the arms and easy guiding of the aligned edges through the arms into the sewing machine in proper alignment for cutting off of the looper portion and closing the toe portion of the circular knit hosiery by overedge stitching.

Some of the objects and advantages of this invention having been stated, other objects and advantages will appear as the description proceeds when taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a perspective view of an overedge sewing machine utilizing the aligning and guiding means of this invention and illustrating a plurality of circular knit hosiery in aligning and guiding means;

FIGURE 2 is an enlarged perspective view illustrating portions of the overedge sewing machine of FIGURE 1 with the aligning and guiding means of this invention attached thereto;

FIGURE 3 is a cross-sectional view of the aligning and guiding means taken along the line 3—3 of FIGURE 2;

FIGURE 4 is a partial elevational view of a portion of the aligning and guiding means taken at the arrow 4 of FIGURE 3;

FIGURE 5 is a partial perspective view of the enclosed toe portion of circular knit hosiery having an increased thickness looper portion thereon;

FIGURE 6 is a cross-sectional view of the aligning and guiding means of this invention illustrating a piece of circular knit hosiery inserted therein; and

FIGURE 7 is a partial perspective view of a portion of circular knit hosiery after the looper portion has been removed therefrom and the toe portion closed by the overedge sewing machine of FIGURE 1.

Referring to the drawings, there is illustrated in FIGURES 1 and 2 an overedge sewing machine, generally indicated by the reference numeral **10**. This machine may comprise any of the conventional Singer, Merrow or other overedge sewing machines and includes a sewing needle **11**, feed dogs **12**, presser foot **13**, a needle plate **14**, a bed plate **15**, a cutting means **16**, and other conventional apparatus, which all cooperate to receive, guide, feed, cut and overedge stitch a product being fed therethrough in a well-known manner. The operation of the overedge sewing machine **10** and the above-described apparatus are all well-known to those with ordinary skill in the art and further detailed discussion herein is not deemed necessary.

The guiding and aligning means of this invention is generally referred to in the drawings by the reference numeral **20** and comprises a pair of elongate, spaced apart, superimposed upper and lower arms **21** and **22**, respectively. The lower arm **22** is attached to the bed plate **15** of the sewing machine **10** in any suitable manner so that the upper surface thereof is in the same horizontal plane with the needle plate **14** and so that the trailing ends of the upper and lower arms **21** and **22** terminate in close proximity to the presser foot **13** and the needle plate **14** for providing proper guiding and alignment of the toe portion of circular knit hosiery as it it presented to the sewing machine **10**.

The upper arm **21** is attached to the lower arm **22** by a pair of identical C-shaped brackets **24**. The arms **21** and **22** are attached to the open ends of the respective leg portions of the C-shaped brackets **24** by any suitable rivet or screw means, as shown in FIGURES 1, 2, 3 and 6. The C-shaped brackets are vertically adjustable for varying the predetermined distance between the upper and lower arms **21** and **22** for purposes to be hereinafter described.

For providing this adjustment feature, the C-shaped brackets **24** each comprise an upper and lower portion **30** and **31** which is held together by a plate **32**. The plate **32** is attached to the lower portion **31** by a screw **33** extending through an aperture in the plate **32** and into a threaded aperture in the lower portion **31**. The plate **32** is attached to the upper portion **30** by a screw **34** extending through an enlongated slot **35** in the plate **32** and into a threaded aperture in the upper portion **30**. The C-shaped brackets **24** further include a threaded member **36** extending from the top of the upper portion **30** through a threaded aperture therein and into a threaded aperture in the lower portion **31**, as shown in FIGURE 3, such that upon rotation of the threaded member **36**, the upper and lower portions **30** and **31** of the C-shaped brackets **24** will move or adjust themselves closer together or farther apart, as desired. During this adjustment through the threaded member **36**, the screw **34** will be loosened such that the screw may slide along the elongated slot **35** in the plate **33** and is then again tightened to lock the upper and lower portions **30** and **31** in the adjusted position.

In operation, a piece of circular knit hosiery, generally indicated in the drawings by the reference numeral **40** and which includes an increased thickness looper portion **41**, may be easily inserted between the upper and lower arms **21** and **22** of the aligning and guiding means **20**. For ease of insertion, the upper and lower arms **21** and **22** include diverging leading ends, indicated at **21'** and **22'**, so that the superimposed edges of the toe portion may be easily inserted between the arms **21** and **22**.

The arms **21** and **22** are adjustably spaced apart a predetermined distance such that the superimposed ends of the toe portion may easily pass between, but so that the increased thickness looper portion **41** may not pass therebetween. When the superimposed edges of the toe portion are inserted between the arms **21** and **22**, they may be easily aligned by pulling the increased thickness looper portion against the sides of said arms which prevents passage therethrough of the increased thickness looper portion **41**, as illustrated in FIGURE 6. The hosiery **40** may then be easily guided by the operator along the aligning and guiding means **20** and into the overedge sewing machine **10** in proper position and alignment for removal of the increased thickness looper portion **41** by the cutter means **16** and overedge sewing of the edges of the toe portion for closing same, as indicated at **42** in FIGURE 7.

Preferably, the arms **21** and **22** of the guiding and aligning means **20** are of sufficient length to accommodate a plurality of hosiery **40**, as indicated in FIGURE 1, for the most efficient operation of the equipment.

Therefore, it may be seen that by the use of the aligning and guiding means of this invention in an overedge sewing machine, circular knit hosiery with increased thickness looper portions thereon may be easily and quickly aligned and guided through the overedge sewing machine for closing of the toe portion thereof to provide continuity in the closures and to eliminate the necessity for the time-consuming and highly-skilled looping operations heretofore necessary in producing quality hosiery.

What is claimed is:

1. In an overedge sewing machine adapted for use in closing the toe portion of circular knit hosiery and having a sewing needle, a needle plate, feed means, a presser foot, and a looper cutting means disposed in advance of said sewing needle, all of which cooperate to receive, guide, feed, remove the looper portion and overedge stitch the toe portion of the circular knit hosiery; the improvement of guiding and aligning means adapted for use with circular knit hosiery having an increased thickness looper portion, said guiding and aligning means comprising a pair of elongate, spaced apart, superimposed, upper and lower arms extending in the longitudinal direction of feed of said sewing machine and terminating in close proximity to said needle plate and said presser foot, said lower arm being mounted on said sewing machine with the upper surface thereof in the same horizontal plane with said needle plate so that the superimposed edges of the toe portion of the circular knit hosiery may be easily guided into said sewing machine, and means adjustably mounting said upper arm in predetermined spaced apart relation to said lower arm sufficient to allow passage therebetween of the superimposed edges of the toe portion and to prevent passage therebetween of the increased thickness looper portion and for varying the spacing between said upper and lower arms to accommodate varying thickness hosiery, whereby the superimposed edges of the toe portion of the hosiery may be inserted between the arms and easily aligned by pulling the increased thickness looper portion against the sides of the arms and then the aligned edges may be easily guided between said arms to said sewing machine in proper alignment for cutting off of the looper portion and closing the toe portion of the circular knit hosiery.

2. In an overedge sewing machine; the combination, as set forth in claim **1**, in which said upper and lower arms are of sufficient length to accommodate a plurality of hose therebetween.

3. In an overedge sewing machine; the combination, as set forth in claim **1**, in which the leading end of said upper and lower arms are diverging for easy insertion of the toe portion of the circular knit hosiery therebetween.

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