May 29, 1962 O. W. HOLDER 3,036,450

KNIT ARTICLE

Filed March 8, 1961

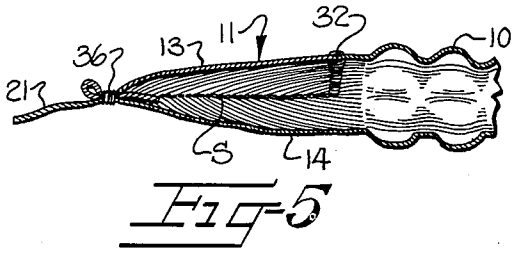


Fig-5

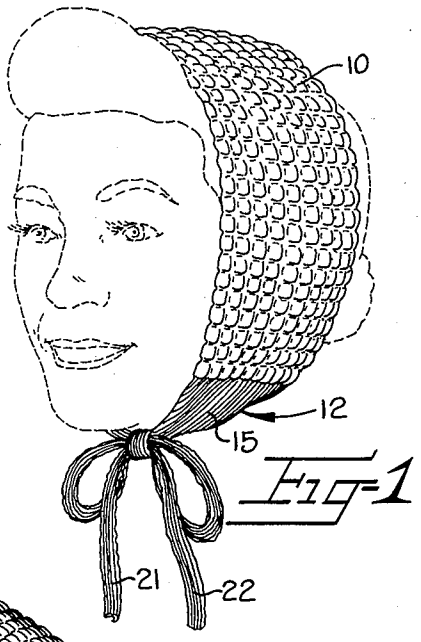


Fig-1

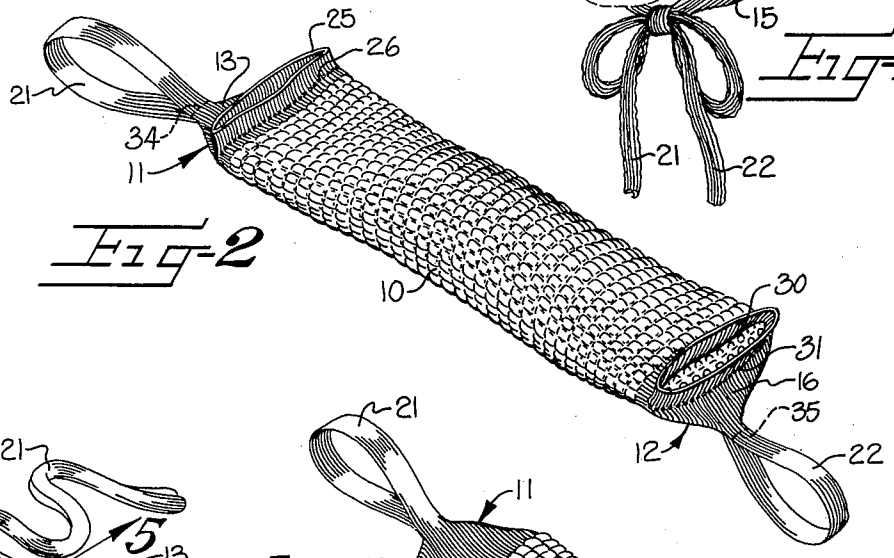


Fig-2

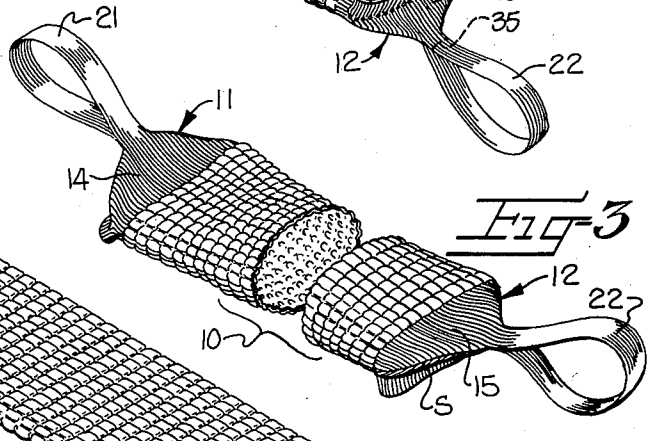


Fig-3

Fig-4

United States Patent Office 3,036,450
Patented May 29, 1962

3,036,450

KNIT ARTICLE

Otis W. Holder, Mount Airy, N.C., assignor to Patent-Hose Corporation, Burlington, N.C., a corporation of North Carolina

Filed Mar. 8, 1961, Ser. No. 94,336
16 Claims. (Cl. 66—171)

This invention relates generally to knit articles of the type which comprise an elongated tubular body and tapering portions extending outwardly therefrom. More particularly, the present invention relates to a knit article of the above type and a method of forming the same wherein opposite ends are provided with tie strings which are connected to the tapered portions and extend outwardly therefrom. The knit article of the present invention is particularly adapted for use as a head warmer and, when used as such, the elongated body is positioned across the top of the head, covers the ears and the tie strings hold opposite ends together beneath the chin of the wearer. However, it is to be understood that the knit article of the present invention may be used for other purposes.

Heretofore, the only known types of knitted head warmers manufactured have been formed by knitting an elongated flat strip of single thickness material and then cutting the ends at inclined angles to form tapered ends to which tie strings are attached after the tapered edges are hemmed. In another type, an elongated tube is knit and flattened and then opposite ends are cut at angles to form tapered end sections. These tapered end sections are then sewed together and tie strings are attached thereto. In both of these types, a considerable amount of cutting and sewing is involved and this involves waste and requires expensive equipment as well as skilled operators to manufacture consistently first quality articles.

Accordingly, it is a primary object of the present invention to provide a knit article having a tubular body and tapered end portions and a method of knitting the same wherein the article is shaped during the knitting thereof and then requires a few relatively simple steps to finish.

It is another object of the present invention to provide a knit article of the type described which may be automatically knit on existing knitting machines of the type which are normally employed to produce hosiery.

It is a further object of the present invention to provide a knit article of the type described which may be economically formed of a single unitary, integrally knit blank which is strong in construction, requires a minimum of stitched seams and in which the type of stitch loops being formed can be easily varied in various portions of the article to produce different types of knit fabric in the desired portions of the article.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

FIGURE 1 is a perspective view of one side and end portion of the knit article when the same is used as a head warmer and showing the same secured in position on the head of a wearer;

FIGURE 2 is an isometric view of one side of the knit article blank in stretched out condition and illustrating its appearance after it is removed from the knitting machine and showing the central portion of the tubular body expanded to substantially a circular condition;

FIGURE 3 is a view similar to FIGURE 2, except showing the other side of the knit article blank, with the central portion of the tubular body broken away;

FIGURE 4 is a view similar to FIGURE 2, except showing the knit article in flattened and finished condition;

FIGURE 5 is a fragmentary enlarged longitudinal vertical sectional view through one end portion of the head warmer, being taken substantially along the line 5—5 in FIGURE 4.

Although the knit article can be used for other purposes, it will be described as a head warmer. When the head warmer is finished, as shown in FIGURE 4, it comprises a flattened elongated tubular body portion **10** having tapered end portions, broadly indicated at **11** and **12**, connected to opposite ends of the body **10** and extending outwardly therefrom. The tapered ends **11** and **12** include respective pairs of fashioned gussets **13**, **14** and **15**, **16** (FIGURES 3 and 4) and the corresponding pairs of gussets are joined together along suture lines formed during the knitting thereof. The outer ends of the tapered ends **11** and **12** have one end of suitable tie strings **21** and **22** connected thereto. The tie strings **21** and **22** are relatively narrow and extend outwardly away from the tapered ends **11** and **12** (FIGURE 4).

The head warmer may be knit on a circular knitting machine of the type normally employed to knit hosiery or it may also be knit on a V-bed flat knitting machine capable of knitting tubular knit goods. It is preferred that the head warmer be knit on a circular machine and the method of forming the same will be described in connection with this type machine. In the present instance, a circular knitting machine having 60 needles in the cylinder is utilized, however, it is to be understood that a machine having a greater or fewer number of needles may be employed.

Knitting of the head warmer is begun by feeding yarn to the needles to form the usual make-up and in the present instance, yarn is fed to alternate needles and then to all of the needles to knit a first tubular portion **25** (FIGURE 2) which is formed of a plurality of successive complete courses. Any desired number of courses may be knit in this first tubular portion **25** and in the present instance, 12 courses are knit. Since these courses will be later cut away and will not form a portion of the head warmer, they may be formed of a relatively cheap yarn before switching to the yarn from which the head warmer is formed. As the portion **25** is completed, a loose course or looper line **26** is formed of abnormally long stitches to aid in placing the stitch loops on the points of a looper to finish the head warmer, in a manner to be later described.

After completion of the tubular portion **25**, half of the needles at one side of the needle cylinder are moved to inactive position and retain their stitch loops thereon. Then, the knitting machine switches into reciprocatory knitting to form partial courses with each knitting stroke of the cylinder on the remaining half of the needles in the cylinder to start the knitting of the gusset **13**. As the successive partial courses of the gusset **13** are knit, the number of needles knitting the succeeding partial courses is gradually reduced to gradually reduce the length of the partial courses in a well-known narrowing operation. During the knitting of the gusset panel **13**, approximately **20** partial courses are knit with one needle being moved to inactive position by the narrowing picks of the machine with each knitting stroke of the cylinder so that approximately ten needles remain in action when the gusset panel **13** is completed.

Reciprocatory knitting continues after completion of the gusset **13** with the narrowing and widening picks in action so that with each knitting stroke, successive partial courses which are 10 needles wide are knit to form the relatively narrow tie string **21** (FIGURE 2). It is to be understood that the needles which were moved to inac-

tive position during the knitting of the gusset **13** retain their stitch loops thereon during the knitting of the tie string **21**.

After a sufficient number of partial courses have been knit to form the desired length of tie string **21**, the narrowing picks are moved to inactive position and the widening pick operates to bring additional needles into knitting position during succeeding knitting strokes. As additional needles are brought into action, the length of succeeding courses of the gusset **14** is gradually increased in a well-known widening operation. As the inactive needles are brought back into action, in knitting the gusset **14**, the endmost stitch loops of the widened partial courses are joined to the endmost stitch loops of the narrowed partial courses of the gusset **13** to connect the gussets **13** and **14** together along sutures indicated at S in FIGURE 5.

Upon completion of the last partial course of the gusset **14**, all of the needles are again activated and the machine switches into rotary knitting to form the complete courses of the tubular body **10**. The body **10** may be formed of any desired stitch construction or it may be formed of plain knitting, if desired. It is preferred that the body **10** be formed of some type of stitch construction which has an ornamental appearance and which contrasts with the plain stitch fabric of the gussets **13** and **14**. In the present instance, tuck stitches are formed in spaced apart wales to provide a plurality of raised rectangular puffs in the body **10**.

Upon completion of the proper number of complete courses to produce the desired lengths of body **10**, half of the needles are again switched to inactive position, the machine switches into reciprocatory knitting and partial courses are formed with each knitting stroke of the cylinder to form the gusset **15** (FIGURE 3). During the knitting of the gusset **15**, the narrowing picks are in operation to gradually reduce the number of needles knitting in succeeding partial courses and reduce the length of the partial courses in a narrowing operation. The inactivated needles hold the endmost stitch loops thereon until they are again activated. After substantially **20** narrowed partial courses have been formed, reducing the number of needles knitting by one needle in each partial course, the machine continues to reciprocate with the narrowing and widening picks in action to thereby knit partial courses which are the same length on the 10 remaining needles to form the tie string **22** (FIGURE 3).

After the desired number of partial courses have been knit to form the desired length in the tie string **22**, the narrowing picks are moved to inactive position and a widening pick operates to begin increasing the length of the partial courses and knit the widened gusset **16** (FIGURE 2). As the partial courses are gradually increased in length, the inactive needles are gradually brought back into action and the stitch loops which they have been holding are connected to the endmost stitch loops of the partial courses of the gusset panel **16** to join the edges of the gussets **15** and **16** together. When approximately 20 widened partial courses have been knit, all of the needles are again activated and the machine switches into rotary knitting to form stitches on all of the needles and knit a tubular portion **30** (FIGURE 2). When knitting of the tubular portion **30** is begun, it is preferred that a loose course or looper line **31** be formed of abnormally long stitches to aid in placing the tubular portion **30** upon the points of a looper to finish the head warmer, in the manner to be presently described. After approximately 12 courses have been formed in the tubular portion **30**, the yarn feed finger is moved to inactive position and the knit head warmer blank is shed from the needles of the knitting machine.

The head warmer blank is then finished by joining the last partial courses of the gussets **13** and **16** to portions of the terminal courses of the body **10** by rows of stitching thread, indicated at **32** and **33** (FIGURE 4) which are formed along the loose course lines **26** and **31**. It is preferred that a conventional hosiery looper be employed to form the rows of stitching threads **32** and **33** because the looper is provided with a trimmer which will automatically cut away the tubular portions **25** and **30** after the stitch loops of the loose courses **26** and **31** are impaled on the looper points. The tubular portions **25** and **30** serve to aid the operator in placing the loose course lines **26** and **31** on the points of the looper and these tubular portions may also be referred to as loopers rounds. However, it is to be understood that the rows of stitching **32** and **33** at opposite ends of the head warmer blank may be formed by other types of seaming or sewing machines, if desired.

The ends of the looped tie strings **21** and **22** are then cut adjacent the gussets **13** and **16** and along the respective dotted lines **34** and **35** (FIGURE 2). This leaves a short tail or free end on each of the gussets **13** and **16** which are tucked in between the corresponding gussets **13, 14** and **15, 16** and sewed by rows of stitching threads indicated at **36** and **37** in FIGURE 4. The rows of stitching threads **36** and **37** also join the outer ends of corresponding pairs of gussets **13, 14** and **15, 16** together. The free ends of the tie strings **21** and **22** are then sewed with an overedge seam to prevent raveling and then the head warmer is finished in a conventional manner.

Of course, if desired, the tie strings **21** and **22** may remain in looped condition and may be tied beneath the chin without severing the same. Also, the tie strings **21** and **22** do not have to be knit integral with the gussets of the tapered ends **11** and **12** but may be formed separately and attached to the tapered ends **11** and **12** later. If the tie strings **21, 22** are attached after the head warmer is knit, they may be made of material other than knit material, such as ribbon or the like.

When the tie strings **21, 22** and head warmer are formed separately, the outer ends of the corresponding pairs of gussets **13, 14** and **15, 16** will be joined together during the knitting of the blank. Thus, the last partial course of the gusset **13** will be joined to the first partial course of the gusset **14** and the last partial course of the gusset **15** will be joined to the first partial course of the gusset **16**.

The head warmer blank of the present invention is completely fashioned on the knitting machine and requires very little manual sewing to finish the same. Of course, the length of the head warmer may be varied by reducing or increasing the number of circular courses formed during the knitting of the tubular body portion **10** and the width of the head warmer may also be varied to some extent by varying the length of stitches drawn and greater variations in width can be obtained by using knitting machines having larger or smaller needle cylinders.

In the drawings and specification there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A knit article comprising a tubular elongated body portion comprising a plurality of complete courses, and a pair of fashioned integrally knit gussets having inner ends connected to opposite ends of said body portion and outer terminal ends, each gusset comprising a plurality of partial courses connected to corresponding partial courses of the corresponding gusset of said pairs.

2. A knit article comprising a tubular elongated body portion, a pair of fashioned integrally knit gussets on each end of said body portion, said pairs of gussets having inner ends connected to corresponding opposite ends of said body portion and outer terminal ends extending away from said body portion, each of said pairs of fashioned gussets tapering inwardly from their inner ends to their terminal ends, and a relatively nar-

row tie string attached at one end to the terminal ends of each of said pairs of fashioned gussets.

3. In a knit article according to claim 2 wherein the knit material forming said body portion is of a different construction than the knit material of said pairs of gussets to provide a contrasting appearance between said body portion and said pairs of gussets.

4. A knit article comprising a tubular elongated body portion comprising a plurality of complete courses, a pair of fashioned integrally knit gussets on each end of said body portion, said pairs of gussets having inner ends connected to corresponding opposite ends of said body portion and outer terminal ends extending away from said body portion, each of said fashioned gussets comprising a plurality of partial courses, the length of the partial courses progressively decreasing from the inner ends to the terminal ends of the gussets, and the ends of the partial courses of one of each of said pairs of gussets being connected to the ends of corresponding partial courses of the other gusset of said pairs of gussets.

5. A knit article comprising a tubular elongated body portion comprising a plurality of complete courses, a pair of fashioned integrally knit gussets on each end of said body portion, said pairs of gussets having inner ends connected to corresponding opposite ends of said body portion and outer terminal ends extending away from said body portion, each of said fashioned gussets comprising a plurality of partial courses connected to corresponding partial courses of the corresponding gusset of said pairs, the length of the partial courses progressively decreasing from the inner ends to the terminal ends of the gussets, and a relatively narrow tie string attached at one end to the terminal ends of each of said pairs of fashioned gussets.

6. A knit article comprising a tubular elongated body portion, a pair of fashioned integrally knit gussets on each end of said body portion, said pairs of gussets having inner ends connected to corresponding opposite ends of said body portion and outer terminal ends extending away from said body portion, the inner end of one gusset of each of said pairs being integrally knit with certain portions of corresponding ends of said body portion, a stitching thread connecting the inner end of the other gusset of each of said pairs to other portions of corresponding ends of said body portion, each of said pairs of fashioned gussets tapering inwardly from their inner ends to their terminal ends, and a relatively narrow tie string attached at one end to the terminal ends of each of said pairs of fashioned gussets.

7. A knit article comprising a tubular elongated body portion, a pair of fashioned integrally knit gussets on each end of said body portion, said pairs of gussets having inner ends connected to corresponding opposite ends of said body portion and outer terminal ends extending away from said body portion, each of said pairs of fashioned gussets tapering inwardly from their inner ends to their terminal ends, and a relatively narrow knit tie string integrally knit with the terminal ends of at least one of the gussets of each of said pairs of fashioned gussets.

8. A method of forming a knit article having an elongated tubular body interknit with a pair of fashioned gussets extending outwardly from each end of the tubular body which comprises the steps of knitting a plurality of partial courses while progressively reducing the length of the partial courses to form a first narrowed gusset, knitting a plurality of partial courses while progressively increasing the length of the partial courses to form a first widened gusset connected to the first narrowed gusset, knitting a plurality of complete courses to form a tubular body connected to the first widened gusset, knitting a plurality of partial courses while progressively reducing the length of the partial courses to form a second narrowed gusset connected to said tubular body, knitting a plurality of partial courses while progressively increasing the length of the partial courses to form a second widened gusset connected to the second narrowed gusset, connecting the first narrowed gusset to the tubular body, and connecting the second widened gusset to the tubular body.

9. A method of forming a knit article having an elongated tubular body interknit with a pair of fashioned knit gussets connected to and extending outwardly from each end of the tubular body which comprises the steps of knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a first fashioned gusset, knitting a plurality of partial courses while gradually increasing the length of the partial courses to form a second fashioned gusset connected to the first gusset, knitting a plurality of complete courses to form a tubular body connected to the second gusset, knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a third fashioned gusset connected to said tubular body, knitting a plurality of partial courses while gradaully increasing the length of the partial courses to form a fourth fashioned gusset connected to the third gusset, connecting the initial partial course of the first gusset to a portion of the initial complete course of the tubular body, and connecting the last partial course of the fourth gusset to a portion of the last complete course of the tubular body.

10. A method of forming a knit article, such as a head warmer, having an elongated tubular body interknit with a pair of fashioned gussets extending outwardly from each end of the tubular body, and tie strings interknit with the gussets and extending outwardly therefrom which comprises the steps of knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a first fashioned gusset, knitting a plurality of partial courses of the same length to form a first tie string connected to the first gusset, knitting a plurality of partial courses while gradually increasing the length of the partial courses to form a second fashioned gusset connected to the first gusset and to the tie string, knitting a plurality of complete courses to form a tubular body connected to the second gusset, knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a third fashioned gusset connected to said tubular body, knitting a plurality of partial courses of the same length to form a second tie string connected to the third gusset, knitting a plurality of partial courses while gradually increasing the length of the partial courses to form a fourth fashioned gusset connected to the third gusset and to the tie string, connecting the initial partial course of the first gusset to a portion of the initial complete course of the tubular body, and connecting the last partial course of the fourth gusset to a portion of the last complete course of the tubular body.

11. In a method according to claim 10 including the steps of cutting the first tie string adjacent its point of connection with the second gusset, cutting the second tie string adjacent its point of connection with the fourth gusset, sewing together the first and second gussets at a point adjacent the first tie string, and sewing together the third and fourth gussets at a point adjacent the second tie string.

12. A method of forming a blank for a knit article having an elongated tubular body and a pair of fashioned knit gussets connected to and extending outwardly from each end of the tubular body which comprises the steps of knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a first fashioned gusset, knitting a plurality of partial courses while gradually increasing the length of the partial courses to form a second fashioned gusset while connecting the ends of the partial courses of the second gusset to the

ends of the partial courses of the first gusset, knitting a plurality of complete courses to form a tubular body with a portion of the initial complete course thereof being connected to the terminal partial course of the second gusset, knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a third fashioned gusset with the initial partial course of the third gusset being connected to a portion of the terminal complete course of the tubular body, and knitting a plurality of partial courses while gradually increasing the length of the partial courses to form a fourth fashioned gusset while connecting the ends of the partial courses of the fourth gusset to the ends of the partial courses of the third gusset.

13. A method of forming a blank for a knit article having an elongated tubular body, a pair of fashioned knit gussets connected to and extending outwardly from each end of the tubular body, and tie strings connected to and extending outwardly from the fashioned gussets which comprises the steps of knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a first fashioned gusset, continuing to knit a plurality of partial courses but of equal length to form a first tie string of uniform width, continuing to knit a plurality of partial courses while gradually increasing the length of the partial courses to form a second fashioned gusset while connecting the ends of the partial courses thereof to corresponding ends of the partial courses of the first gusset, knitting a plurality of complete courses to form a tubular body while interknitting the first course thereof with the last partial course of the second gusset, knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a third fashioned gusset while interknitting the first partial course thereof to a portion of the last complete course of the tubular body, continuing to knit a plurality of partial courses but of equal length to form a second tie string of uniform width, and continuing to knit a plurality of partial courses while gradually increasing the length of the partial courses to form a fourth fashioned gusset while connecting the ends of the partial courses thereof to the corresponding ends of the partial courses of the third gusset.

14. A method of forming a blank for a knit article having an elongated tubular body, and a pair of fashioned knit gussets interknit with and extending outwardly from each end of the tubular body which comprises the steps of knitting a plurality of complete courses to form first loopers rounds, knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a first fashioned gusset with the initial partial course of the first gusset being interknit with a portion of the last complete course of the first loopers rounds, knitting a plurality of partial courses while gradually increasing the length of the partial courses to form a second fashioned gusset while connecting the ends of the partial courses of the second gusset to the ends of the partial courses of the first gusset, knitting a plurality of complete courses to form a tubular body with a portion of the initial complete course thereof being interknit with the last partial course of the second gusset and with the other portion of the initial complete course of the tubular body being interknit with a portion of the last complete course of the loopers rounds, knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a third fashioned gusset with the initial partial course of the third gusset being interknit with a portion of the last complete course of the tubular body, knitting a plurality of partial courses while gradually increasing the length of the partial courses to form a fourth fashioned gusset while connecting the ends of the partial courses of the fourth gusset to the ends of the partial courses of the third gusset, and knitting a plurality of complete courses to form second loopers rounds with a portion of the initial complete course thereof being interknit with the last partial course of the fourth gusset and with the other portion of the initial complete course of the second loopers rounds being interknit with a portion of the last complete course of the tubular body.

15. A method of forming a blank for a knit article having an elongated tubular body, a pair of fashioned knit gussets connected to and extending outwardly from each end of the tubular body, and tie strings connected to and extending outwardly from the fashioned gussets which comprises the steps of knitting a plurality of complete courses to form first loopers rounds, knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a first fashioned gusset, continuing to knit a plurality of partial courses but of equal length to form a first tie string of uniform width, continuing to knit a plurality of partial courses while gradually increasing the length of the partial courses to form a second fashioned gusset while connecting the ends of the partial courses thereof to the corresponding ends of the partial courses of the first gusset, knitting a plurality of complete courses to form a tubular body while interknitting the first course thereof with the last partial course of the second gusset and a portion of the last complete course of the first loopers rounds, knitting a plurality of partial courses while gradually reducing the length of the partial courses to form a third fashioned gusset while interkniting the first partial course thereof to a portion of the last complete course of the tubular body, continuing to knit a plurality of partial courses but of equal length to form a second tie string of uniform width, continuing to knit a plurality of partial courses while gradually increasing the length of the partial courses to form a fourth fashioned gusset while connecting the ends of the partial courses thereof to the corresponding ends of the partial courses of the third gusset, and knitting a plurality of complete courses to form second loopers rounds while interknitting the first course thereof with the last partial course of the fourth gusset and with a portion of the last complete course of the tubular body.

16. A method of forming a knit article having an elongated tubular body interknit with a pair of fashioned gussets extending outwardly from each end of the tubular body which comprises the steps of knitting a first plurality of partial courses while progressively reducing the length of at least the first knit partial courses while progressively increasing the length of at least the last knit partial courses and while joining together the ends of the progressively reduced and the progressively increased partial courses, knitting a plurality of complete courses to form a tubular body, and then knitting a second plurality of partial courses while progressively reducing the length of the partial courses of at least the first knit partial courses while progressively increasing the length of the last knit partial courses and while joining together the ends of the progressively reduced partial courses and the progressively increased partial courses.

References Cited in the file of this patent

UNITED STATES PATENTS

1,072,735	Kellner et al.	Sept. 9, 1913
1,157,341	Tallerday	Oct. 19, 1915

FOREIGN PATENTS

548,850	Belgium	July 14, 1956