This invention pertains to cuffs for use on garments such as sweaters, hose and the like and more particularly, to knitted, extensible, elastic cuffs which are so knit as to have pile tufts incorporated and projecting outwardly of the cuff as worn, and to a method of forming the same.

It is a general object of the invention to devise a cuff for garments of the type described which shall be characterized by deep pile of uniform and luxurious appearance and which may resemble a fur cuff to a considerable extent.

It is a further object to form such a cuff by knitting, to form it with a great deal of elasticity so it may be extended to be drawn on over a hand or foot with ease and yet will have a recovery such that it may fit snugly when in place.

A further object is that of so knitting such a cuff in a knitting machine that it may be sewed to the garment or may be topped onto the needles after which the remainder of the article is knitted in extension of the cuff.

Another object is that of forming such a cuff cheaply and by simple processes and mechanism.

A further object is that of providing a cuff of knitted material in which the pile may be of any desired density or length and which may be laundered or cleaned without danger of the pile becoming displaced or pulled from the base fabric.

A further object is that of devising a cuff which may be dyed before its incorporation in a garment or after that so it may be of the same color as the remaining part of the garment or may be of different color or shade.

Other objects will become apparent from the following more detailed disclosure.

Various schemes have been devised for forming cuffs on hose, sweater sleeves, gloves and the like and in many instances these have comprised some sort of knitted pile fabric, but in all such instances, these have involved terry loops, have been rather loosely incorporated or spaced and have had little density or uniformity.

According to the invention, a base fabric is knitted to incorporate elastic thread either by knitting or inlaying and also to have pile tufts knit in at least some of the courses and wales. This fabric is, according to one preferred form of the invention may take, knit as string work each unit of which comprises enough material for a cuff, either of single thickness or doubled, and having a selvage, a fold line if folding is contemplated, and a course of loose stitches and a separation or pull course. Such units may be separated and topped on the needles of a hosiery or other knitting machine to form a cuff of an article of hosiery then knitted in continuation of the cuff.

In other cases the cuff may be directly formed on the machine which knits the remainder of the article of which it forms a part. Again, it may be connected by sewing directly the article or may be connected by means of any of the usual detachable fasteners.

The invention will be described in greater detail by reference to certain embodiments thereof as illustrated in the accompanying figures of drawing, wherein:

Fig. 1 is an elevational view showing a sock to which a cuff according to the invention has been applied.

Fig. 2 is a view showing in perspective cuffs as formed in string work.

Fig. 2a is a detail view of tuck stitches such as used at a fold line, Fig. 2.

Fig. 3 shows one form of fabric in which elastic is knit in and pile tufts are incorporated at non-adjacent wales.

Fig. 4 is a view of a similar fabric in which pile tufts and elastic loops are staggered.

Fig. 5 is a similar showing of a fabric in which the pile loops are incorporated at each course and wale and the elastic thread inlaid at spaced courses and wales.

Fig. 5a is a perspective view showing a section of the fabric of Fig. 5 to greatly enlarged scale.

Fig. 6 is a schematic view illustrating the method of knitting in the elastic.

Fig. 7 is a similar view showing inlaying the elastic. Now referring to Fig. 1, a cuff 10 is shown as applied to a sock generally indicated by numeral 11 and having the conventional leg and foot including a heel and toe.

Such a sock may be knitted on a circular, independent needle, half hose knitting machine and preferably, the cuff or top is to be formed on a separate machine and may be tapped onto the needles of the first machine in a known manner.

As shown, the cuff 10 is formed of double length with elastic incorporated to draw it in to an appropriate diameter to fit the ankle of the wearer and to permit it to stretch sufficiently to be drawn on over the foot. Pile tufts are incorporated in the topmost half, more or less, of the cuff (shown in dot-and-dash lines) which is folded down and outwardly so that the pile is at the outside. Socks such as this may be used for skating or put to other uses and may be of longer length if desired.

Referring to Fig. 2, such a cuff knitted as a series in string work will comprise a selvage 2, a section 13 to be turned outwardly and which is knitted with pile tufts 14 incorporated as will hereinafter be described. While not entirely essential, a loose course or a course of tuck stitches 15 may be formed to present a definite fold line.

Fabric F more or less equal in length to that at 13, is then knitted with the elastic yarn still incorporated but without pile. This section preferably terminates in a topping or loose course 16 after which a separation or draw thread 17 is incorporated in known manner. This latter permits the units to be readily disconnected. While such cuffs may well be formed singly and dropped from the needles, the form preferred is that shown and, of course, a following cuff with selvage, etc., is continued after the draw thread 17.

Now referring to Figs. 3–5 several representative forms which the pile fabric may take will be described. It is to be understood that the incorporation of the elastic yarn may be varied widely as to the courses and wales into or at which it is incorporated to be held and thus, disclosure as here given is by way of example only.

Referring to Fig. 3, courses 19, 20, 22 and 24 are drawn from an inelastic yarn 25 which is taken by every needle, but only every other needle of which takes fibers which they draw along with the yarn 25. Thus fibers are formed into tufts 26 at alternate wales 27, 29, 31 and 33.

An elastic yarn E, either covered or uncovered, preferably the former, is drawn into knitted stitches at these alternate wales thus appearing at spaced courses, at least in theory and sequence, although in actual practice such a yarn being very extensible and contractile will draw
up as the fabric is released whereupon its loops more or less lose their identity as such.

This fabric can be extended in either direction as the elastic is stretched laterally with the base fabric. Since it contracts and draws the fabric together, weaves 28, 30 and 32 will be pushed to the jersey face or side of the fabric opposite to side which the pile projects as the wales with the pile are drawn closer together. For that reason one may control the cover of the pile so it need be inserted in spaced wales only, for many purposes.

When binding the cloth walewise, loops of elastic are reformulated and are extended thus permitting the fabric to elongate.

Normally, inelastic fabrics of this type are knitted fairly tightly so that the tufts will not come out during treatment, use, washings, etc. The extension of the fabric might well result in loosening the pile but to prevent that, the elastic yarn is so positioned that it draws the loops and tufts of one course into contact with those of a next course so that a pinching and frictioning condition is set up thereby to hold the tufts in place.

In Fig. 4 a similar fabric structure is shown, but this fabric, although it has spaced courses 34, 36 and 38 knitted from non-elastic yarn and intermediate courses 35, 37 and 39 from elastic, the arrangement is one of staggering elastic loops and also pile tufts so they appear in alternate wales 40, 42 and 44 in courses 35 and every other course following, but in wales 41, 43 and 45 in courses 34, 36, etc. In some instances this may give a better cover and presents an appearance of uniformity when stretched as well as when contracted.

In Fig. 5 pile tufts are formed on every stitch in each course and elastic yarn 46 is inside at alternate wales 47, 49 and 51 being floated in back of intermediate wales 48, 50, etc. Here we have elastic yarn at every course, but it is to be understood that elastic yarn may be inlaid every other course or spaced more widely as the occasion may demand or make more advisable.

The extensibility here is mainly in a lateral direction, but the elastic inlaid and floated as shown will assist in holding the tufts in place as the fabric is extended and the elastic drawn more tightly into frictional contact with its surrounding material.

In Fig. 6 mechanism adapted to knit the fabric of Fig. 3 is shown. An open top, independent needle machine is employed in which a complement of needles, 52, 53 and 54, are in the usual needle cylinder and cooperate with sinkers (not shown). Needles are raised to take fibers from a doffing cylinder 53, a base yarn 54 fed in any convenient way as from a guide 55 and to be drawn down to be lifted from a guide 56, the needle division is effected in any convenient manner as by arranging the butts thereon alternately as long and short butts. As illustrated, alternate needles are raised higher than intermediate ones and take tufts of fibers. The intermediate needles are raised to a position to clear their latches and take the yarn 54. Needles raised to take the fibers must not be raised to such a height that they clear their latches above the feeding yarn 54. Both long and short butt needles are drawn down to knit and draw stitches of the base yarn with a tuft at every other loop. After a following feeding station an elastic yarn is fed by a guide 58 and here long butt needles only are raised to clear their latches, take the elastic yarn and knit. Of course, a multifeed knitter will have a number of each of these feeding stations alternately arranged and preferably for feeding means are interposed between the usual, more involved cards and feeding stations at which the base yarn and pile tufts are presented and incorporated in the fabric.

To knit the fabric of Fig. 4, an alternating arrangement is shown and preferably needles should be provided with a number of butts or with jacks. With the latter, all needle butts may be of uniform length and jacks used selectively to cause both the pile and the elastic yarn to be taken by alternate needles at one pair of feeds, but at intermediate needles on the next pair, etc. Of course, those skilled in the art will recognize the fact that many different combinations may be forthwithed and the skilled knitter should understand the manner in which a jack pattern could be set up to accomplish the knitting of such variations.

To knit the fabric of Fig. 5, the elastic yarn 46 is fed from a guide 59, Fig. 7, in advance of what may be termed a main feeding station, and is presented in such position that selected needles receive that yarn below their latches. At the following station a card doffer roll 60 presents parallelized sliver to either all or to spaced needles as is desired whereupon all needles then take a base yarn 61 fed from tube 62 and knit that yarn at the same time inlaying the elastic and incorporating the fibers as pile.

Here the needles which do not receive the elastic thread below their latches pass in front of that thread as they are raised to take their fibers and yarn 61. All needles draw a tuft, but the elastic is laid in to be held at every other wale and preferably, at every other course so that it would only be alternate feeding stations which would be preceded by one of these elastic yarn feeding and needle dividing stations. Of course, the elastic yarn may be spaced to be held at more widely spaced loops and may skip more courses in which the elastic yarn is held than will be necessary to cause both the pile yarn and the elastic yarn to be inlaid as preferred. With the latter, all needle butts may be spaced in any desired manner both coursewise and walewise.

The base fabric may be knitted from any relatively non-elastic yarn such as cotton, animal fibers or artificial filaments or, in some instances it may be to advantage to employ a yarn of the type having considerable extensibility although it does not classify as one of the elastic yarns in which rubber in some form, either natural or synthetic, is to be found. Any one of the nylon type yarns or other so-called "stretch" yarns may be used. In some instances where too great provision for stretch is desired such a "stretch" yarn may be employed instead of the covered or other rubber yarn which has been described by way of setting forth the preferred form which the invention may take.

Spacing of the elastic yarn both coursewise and walewise in case ring 66. For each set of jacks the tension under which it is incorporated should be maintained at such level that it contracts to a considerable extent in order to impart the necessary characteristics of stretchability and recovery to the fabric and also, to tighten the stitches so that the tufts of pile will be held in both when the fabric is maintained in relaxed and in extended condition. The extensibility is also to be governed in accordance with the required diameter of the material in the cuff as the same is relaxed or presented on the counter for sale, and also the limits of contraction and extensibility should incorporate the necessary characteristics of stretch yarns. Thus, not only may the same be applied, the cuff may be sufficiently extended so that it will be drawn over the hand or foot of the wearer without using unnecessary force or subjecting the fabric to such distortion as to damage the elastic incorporated or to displace the same in the manner not advisable from the point of view of preserving the appearance and pleasing characteristics presented by the pile or other elements of the material.

In Fig. 5a this inlaid type fabric is shown more or less as it appears in actual practice except for the fact the loop structure is shown more open and the diameter of yarns smaller than should actually be the case. This
shows that the pile loops cover the surface very effectively and also that the elastic yarns pinch and hold the pile loops or tufts in place.

Instead of topping a cuff on needles and then knitting, a knitted sock, glove, sleeve or the like may have the cuff sewed in place. Of course, a seam sufficiently stretchable is employed so that it does not restrict the stretch of the garment at that point when it is put on. A still further method of attachment may be that of using buttons, hooks, snap connectors or the like in which event the cuff may be detached for laundering or other purposes.

Instead of folding the material over, it is quite possible to knit units comprised as a single thickness of base material with elastic incorporated and pile projecting throughout its length except for a selvage course and a topping course if the same are used. In fact, if a cuff is to be sewed in place, then it may well be that a single thickness of material is much more practical.

With turned or folded tops elastic is most desirably incorporated in the outer part as worn to restrict it and to make it fit, but such yarns may be omitted at the inner layer so long as that fabric has the required amount of stretch, etc.

Of course, the pile knitted in this manner is to be finished by shearing, chemical and electrostatic treatment in the known manner and such treatment may be varied to obtain something more or less in the order of velvet or may leave the pile long and of a finish to resemble the pelt of various animals.

While it is preferred to form these cuff portions separately, the same may be formed on that machine which knits the continuing article. In such cases that machine must be provided for incorporating the elastic yarn and also the tufts for the pile.

We claim:

1. A garment, a knitted cuff portion comprising an elastic, extensible, knitted base and a pile projecting outwardly from said base as the garment is worn, said base being knitted from a non-elastic yarn in which an elastic yarn is incorporated to be held at some of the wales and some of the courses, and in which said pile is comprised as individually drawn, separate tufts of fibers incorporated during knitting at some of the knitted stitches of the base fabric.

2. A garment cuff as defined in claim 1 wherein said elastic yarn is knitted at spaced wales of the base fabric.

3. A garment cuff as defined in claim 1 wherein said elastic yarn is inlaid to be held at spaced wales of the base fabric.

4. A garment, a knitted cuff comprising a folded portion one ply at least of which comprises an elastic extensible, knitted base and a pile projecting outwardly from said base as the garment is worn, said base being knitted from a non-elastic yarn and as jersey material in which an elastic yarn is incorporated to be held at some of the wales and some of the courses, and in which said pile is comprised as individually drawn, separate tufts of fibers incorporated during knitting at some of the knitted stitches of non-elastic yarn of the base fabric.

5. A knitted cuff for incorporation into a knitted garment which comprises a section formed without pile and a section formed with pile projecting outwardly as the cuff is folded to wear, said section without pile having at one extremity a loose course for topping, a course including tuck stitches marking the transition between sections for folding and the other section containing pile formed as individually drawn, separate tufts of fibers incorporated during knitting, said section terminating in a selvage.

6. A knitted cuff as defined in claim 5 wherein an elastic yarn is incorporated at spaced wales and at a plurality of courses to contract the fabric and to permit a relatively great amount of extensibility.

7. A method of forming a cuff for hosiery and the like which comprises the steps of knitting a base fabric of non-elastic yarn, incorporating elastic yarn therein under tension at spaced wales and at some of the courses, knitting into said courses of non-elastic yarn individually constituted tufts of fibers to form a pile and providing a selvage at the free end of said cuff and a course of loops at its opposite end by which it is to be attached to that article for which it is to serve as a cuff.

8. A method as defined in claim 7 in which a series of said cuffs are knitted in string work and a draw course is formed between each said cuff to facilitate their separation.

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