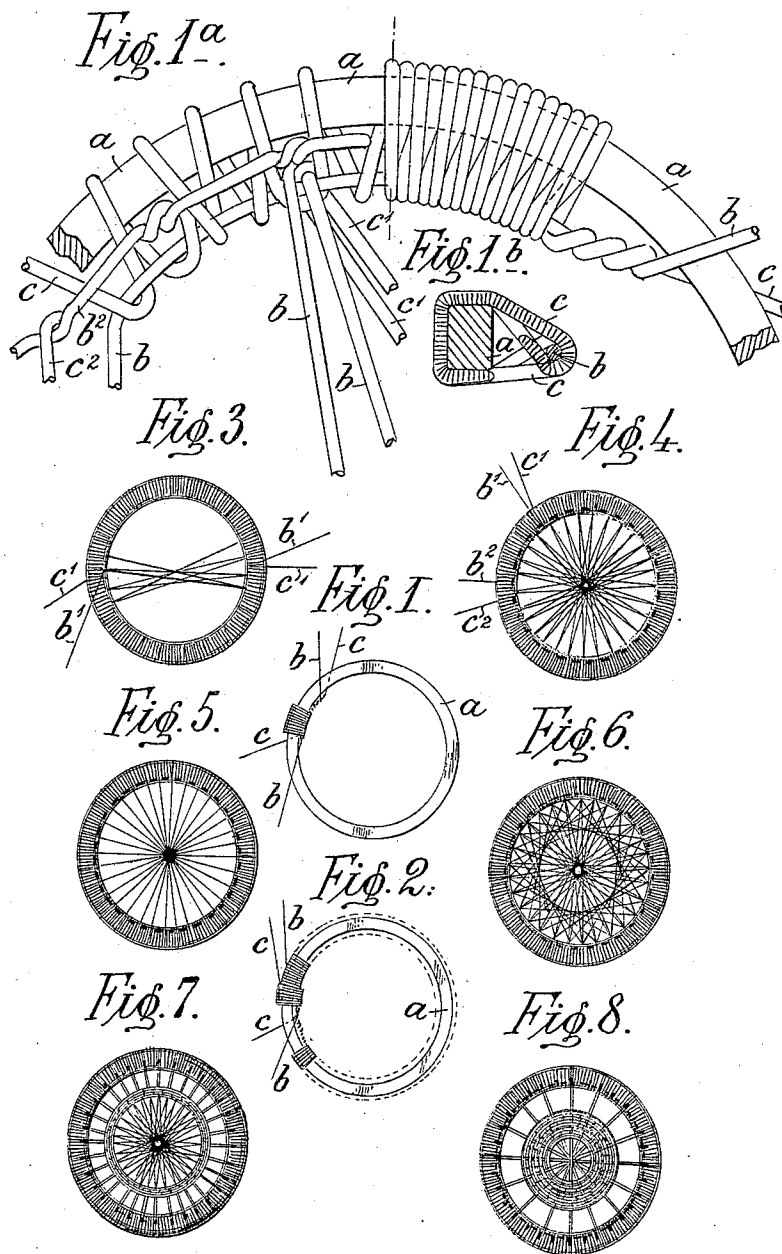


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 THREAD BUTTON.
 APPLICATION FILED JUNE 16, 1909.

Patented May 2, 1911.
 3 SHEETS-SHEET 1.



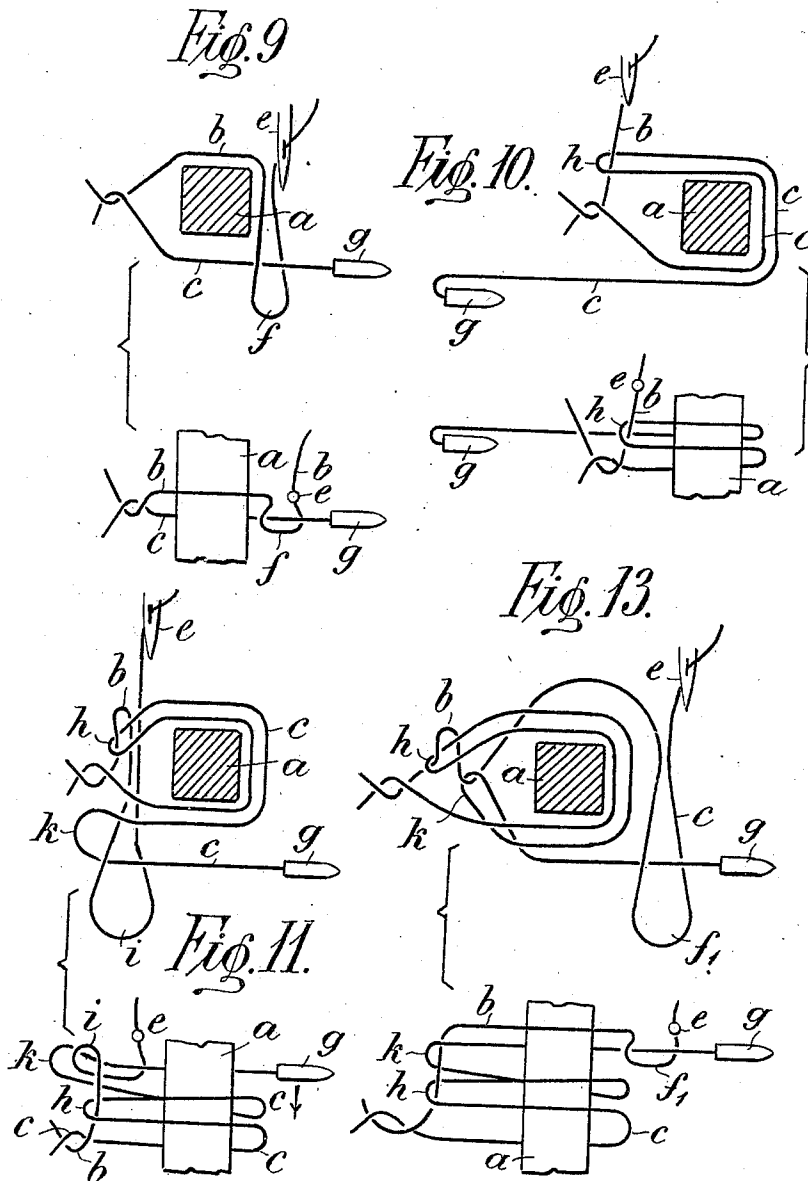
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3 SHEETS-SHEET 2.



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 3 SHEETS-SHEET 3.

Fig. 12.

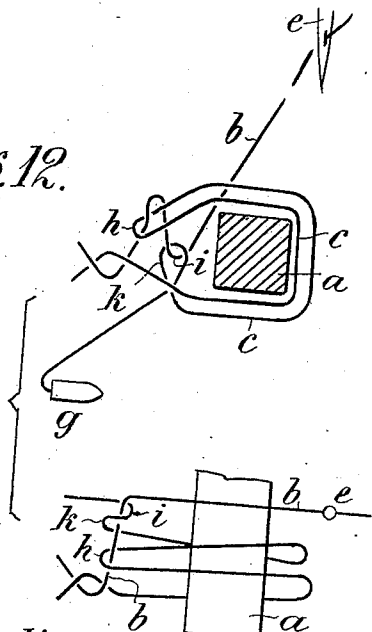


Fig. 14.

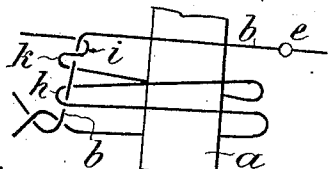


Fig. 15.

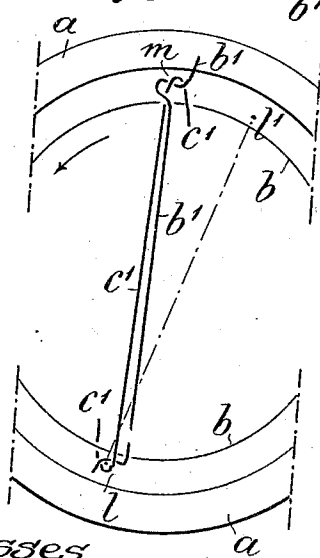
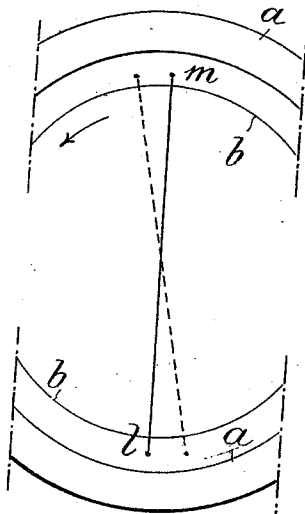


Fig. 16.



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THREAD BUTTON.

990,887.

Specification of Letters Patent.

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Application filed June 16, 1909. Serial No. 502,596.

To all whom it may concern:

Be it known that I, HEINRICH LAULA, a subject of the Emperor of Austria-Hungary, residing at 30 Hochsatzengasse, Vienna, XIII, Empire of Austria-Hungary, have invented new and useful Improvements in Thread Buttons, of which the following is a specification.

This invention has for its object to provide an improved process of manufacture of thread buttons having a metal frame by exclusive use of the sewing machine.

In the drawings:—Figure 1 illustrates the commencement of the improved process. Fig. 1^a is a plan, and Fig. 1^b is a cross section both drawn on a larger scale illustrating the manner of laying the thread. Figs. 2, 3 and 4 illustrate different progressive stages of the process. Figs. 5, 6, 7 and 8 illustrate different designs of buttons made according to this invention. Figs. 9 to 16 are diagrams illustrating the various steps of the improved process.

Referring first to Figs. 1 to 4, *a* is the metal button ring or frame of the button which it is desired to cover with thread by sewing in a sewing machine to form the finished button. The button ring *a* is clamped in a casing or holder of the sewing machine, and this holder receives during the first part of the process an intermittent rotary motion whereby the button ring *a* is rotated intermittently on its axis each time through a distance equal to twice the thickness of the thread. *b* is the top or needle thread, *c* is the under or shuttle thread drawn from the shuttle. The ends of these threads *b* and *c* are fastened to the holder. Then the sewing machine needle makes a series of stitches on the inside of the button ring *a* whereby the two threads are looped around each other in the manner shown at *d* in Figs. 1 and 1^a. Then the sewing is continued in the following manner illustrated in side elevation and plan in the diagrams, Figs. 9 to 13, the needle besides moving up and down also moving to and fro radially relatively to the ring. Supposing the needle is inside the ring, then after the needle *e* has raised above the ring it moves radially outward and then moves first downward and then upward whereby the top or needle thread *b* is drawn from the inside of the ring *a* over its top side and downward on the outside of the ring forming a loop *f* during its next fol-

lowing upward movement through which loop the shuttle *g* draws the under or shuttle thread as is usual in making a lock stitch (Fig. 9). The needle then rises together with the needle thread loop and the shuttle returns whereby a loop *h* is formed in the under or shuttle thread *c* as usual in lock stitch sewing. Then the needle moves radially to the ring and above the same from its outside to its inside and at the same time the upper or needle thread is drawn tight by its tension or take up device. Thereby the loop *h* formed in the under or shuttle thread is pulled by the top or needle thread over the ring *a* as shown in Fig. 10. The ring then advances through a suitable distance say double the thickness of the under or shuttle thread or more in the direction of the arrow, Fig. 11, the needle descends and the shuttle *g* advances drawing the under or shuttle thread through the loop *i* formed by the top or needle thread whereby a loop *k* in the under or shuttle thread is formed as shown in Fig. 11. The shuttle then returns and the needle moves radially outward whereby the loop *k* and the top or needle thread are left in lock stitch concatenation on the inside of the ring, Fig. 12. The needle then moves downward outside the ring and on rising again a loop *f'* is formed by the top or needle thread as shown in Fig. 13. The position of the parts is exactly the same as that shown in Fig. 1 and the operation just described is repeated. Thus it will be seen that each couple of successive stitches made will result in the formation of an under or shuttle thread loop beginning at the inside of the ring at *h* passing over the top side and down at the outer side and then returning on the bottom side of the ring to its inside at *k* both ends *h*, *k* of this loop being locked at the inside of the ring by the top or needle thread *b*. In this way as this sewing is continued for one revolution of the ring the entire ring will be covered by such shuttle thread loops as is indicated on the right hand side of Fig. 1^a and as the ring approaches the end of one revolution, the two threads looped around each other as indicated at 10, Fig. 1^a in the first stage of sewing will be caught and locked by these shuttle thread loops along with the top or needle thread *b* serving to lock the shuttle thread loops in order to prevent the thread covering of the button from unraveling as

shown in Fig. 2. When the button ring *a* has been completely covered with thread as just described, the second part of the process is commenced in the manner shown in Fig. 3.

3. The needle does not experience now a movement at right angles to its axis as before; it simply moves up and down vertically passing between the button ring *a* and the thread *b* lying on its inner side and locking the shuttle thread loops *h* and *k* as above set forth while the ring *a* is turned around its axis step by step always in one direction each step being a multiple of a fraction of a revolution for instance $\frac{1}{3}$ of a revolution of $168\frac{1}{3}$ degrees. This stage of the process is illustrated in Fig. 3 and diagrammatically on a larger scale in Figs. 14 and 15 in which latter for the sake of clearness the shuttle thread loops covering the ring are omitted.

The needle descends and then rises between the ring *a* and the upper or needle thread *b* whereby the needle thread marked *b'* for better distinguishing it makes a lock stitch *l* with the shuttle thread *c'* this lock stitch being located between the ring *a* and the thread *b* as shown in Fig. 14. Then the ring is caused to turn around its axis through the desired angle, say $\frac{1}{3}$ of a revolution in the direction of the arrow, Fig. 15, the needle being of course above the ring and not moving radially to the ring nor partaking in its partial rotation. Thereby the stitch *l* just previously formed and firmly held in position relatively to the button ring by the thread *b* and the loops *h* *k* of the covering hereinbefore described is brought into the position shown in Fig. 15 at the desired angular distance from the needle. In this movement of the ring the needle thread and the shuttle thread are drawn across the button on its top and bottom side respectively, the thread tension devices furnishing the length of thread required for this purpose. The needle then descends and ascends again whereby another lock stitch *m* is made between the thread *b* and the ring *a* as shown in Fig. 15. Thus the two stitches are united by lengths of needle and of shuttle thread running on the top and bottom side of the button respectively along a chord of the desired angle as will be understood from Fig. 15. The ring then again turns through the same angle as before whereby the stitch *l* comes into the position *l'* and the lengths of threads connecting the stitches *l* and *m* come into the position indicated by the dotted line in Fig. 15. The needle then makes another stitch and the ring another turn through the same angle and so on whereby the threads connecting the stitches successively made are caused to form a star shaped net as shown in Fig. 3. After a certain number of consecutive steps, 32 in the example illustrated by Figs. 3 and 4, the sum of which makes up a number of complete

revolutions (15 in the above example) the star shaped net is completed covering the inside of the ring as shown in Fig. 4 and being locked by the thread *b*. After the completion of the star-shaped net, the intermittent rotation of the button ring is reduced for instance to approximately $11\frac{1}{4}$ degrees, but the needle continues to move up and down only without moving radially. This produces by means of the top thread *b*² and the underthread *c*² a lockstitching in the usual manner further locking the points of the star on the inside of the button ring and the shuttle thread loops *h*, *k*. This lockstitching renders the knotting together of the ends of the threads composing the net unnecessary, and prevents the net from unraveling. The button is thus finished ready for use.

The left hand side of Fig. 1^a shows the various stitchings hereinbefore described drawn apart for more clearly showing their relative positions.

The various movements of the needle and the ring may be obtained by any known or suitable mechanisms which do not form part of the present invention and which therefore need not be more fully described herein.

Thread buttons of different designs may be produced by varying the feed of the ring during the making of the net work. If for instance the ring is alternately fed through an angle of 180 degrees ($\frac{1}{2}$ revolution) and $11\frac{1}{4}$ degrees of a $\frac{1}{3}$ revolution a stitch being made after each step, then the operation will be the following, see Fig. 16. After the needle has made a stitch, the ring is turned through 180 degrees whereby the stitch *l* so made comes diametrically opposite the needle which then makes another stitch at *n* so that the threads connecting the two stitches run along the diameter *l m*. The ring is then turned through a fraction say $\frac{1}{3}$ of a revolution ($11\frac{1}{4}$ degrees) whereby the said diameter comes into the position shown by a dotted line; then by the next two stitches and intermediate feed of 180 degrees a fresh pair of threads will be drawn across the ring along the diameter *l, m* and so on whereby the design shown in Fig. 5 will be obtained. After the completion of one star shaped net as above described another star shaped net overlapping the first one may be produced in a similar way by simply changing the feed of the ring. Thus for instance if after completing the star shaped net shown in Fig. 4 the sewing is continued, but with the ring being fed at each step through a different angle or multiple of a fraction of a revolution, say $\frac{1}{3}$ of a revolution or $123\frac{1}{3}$ degrees then the design shown in Fig. 6 will be obtained, the star shaped net corresponding to steps of $\frac{1}{3}$ of a revolution overlapping the star shaped net corresponding to steps

of $\frac{1}{2}$ of a revolution. The stitching $b^2 c^2$ above described will have to be made after finishing the second star shaped net. Or after the completion of one or more star shaped net or nets as above described the ring may be shifted so as to bring its center near to the needle and may then be intermittently revolved by little steps as in making the stitching $b^2 c^2$ the needle moving simply up and down. Thereby a circular row of stitches will be produced inside the ring and the thread b , whereupon the ring may be further shifted to again change the distance of its center from the needle and another circular row of stitches may be made and so on, as often as may be desired in this way designs such as shown in Figs. 7 and 8 are produced, such designs consisting of a star shaped net and one or more concentric circular rows of stitches inside the ring. Thus a thread button will be produced having a rigid ring provided with a covering composed of shuttle thread loops locked inside the ring by the circular needle thread b substantially concentric to the ring, the inside of the ring being filled or covered by a star shaped design composed of stitches running along chords of the ring and locked by the said circular needle or upper thread and the covering, the whole being strengthened, if desired, by circular rows of stitches inside the ring and inside or outside the said circular needle thread as shown.

I claim—

1. As a new article of manufacture, a thread button consisting of a rigid ring, a covering on such ring built up of a thread inside and substantially concentric to the ring, thread loops locked in lock stitch concatenation to the said concentric thread, each such thread loop running from one point of concatenation below the bottom side of the ring to its outside and over its top side back to the next point of concatenation at the inside of the ring, and a star shaped design filling the inner space of the ring and built up of lock stitches running along chords of the ring, the points of concatenation of said threads at both ends of each of such lock stitches being between the

said concentric thread and the ring, substantially as and for the purpose described.

2. As a new article of manufacture, a thread button consisting of a rigid ring, a covering on such ring built up of a thread inside and substantially concentric to the ring, thread loops locked in lock stitch concatenation to the said concentric thread, each such thread loop running from one point of concatenation below the bottom side of the ring to its outside and over its top side back to the next point of concatenation at the inside of the ring, a star shaped design filling the inner space of the ring and built up of lock stitches running along chords of the ring, the points of concatenation of the thread at both ends of each of such lock stitches being between the said concentric thread and the ring, and a circular row of lock stitches between the outer ends of the said star shaped design and the ring, substantially as and for the purpose described.

3. As a new article of manufacture, a thread button consisting of a rigid ring, a covering on such ring built up of a thread inside and substantially concentric to the ring, thread loops locked in lock stitch concatenation to the said concentric thread, each such thread loop running from one point of concatenation below the bottom side of the ring to its outside and over its top side back to the next point of concatenation at the inside of the ring, a star shaped design filling the inner space of the ring and built up of lock stitches running along chords of the ring, the points of concatenation of the threads at both ends of each of such lock stitches being between the said concentric thread and the ring, and a circular row of lock stitches between the center of the ring and the said concentric thread, substantially as and for the purpose described.

In testimony whereof, I affix my signature, in presence of two witnesses.

HEINRICH LAULA.

Witnesses:

ARTHUR BANMANN,
AUGUST FUGGER.