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FEEDING MECHANISM FOR SEWING MACHINES

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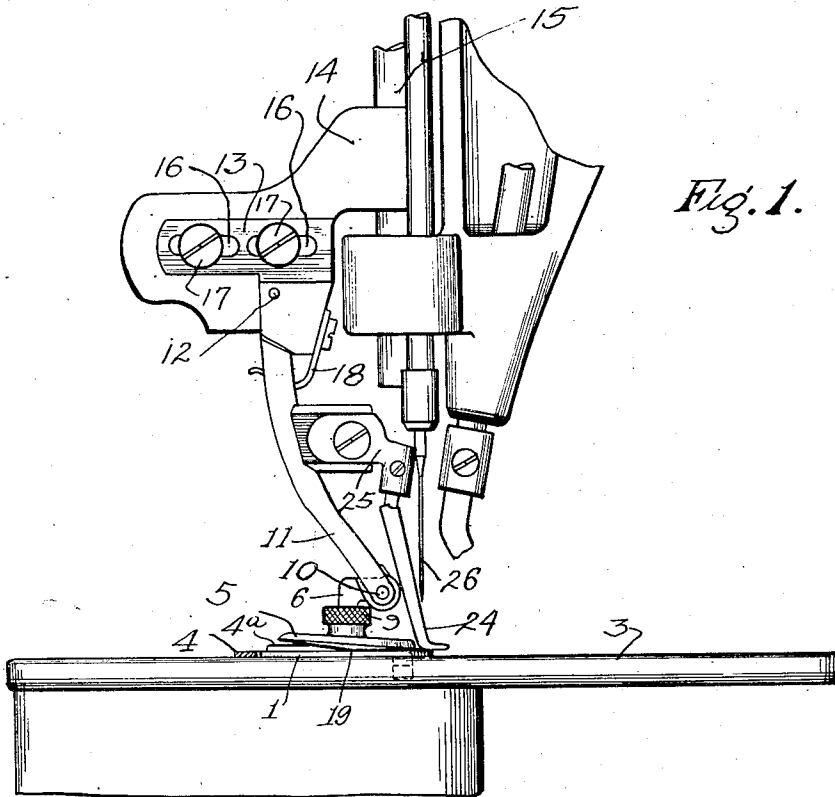


Fig. 1.

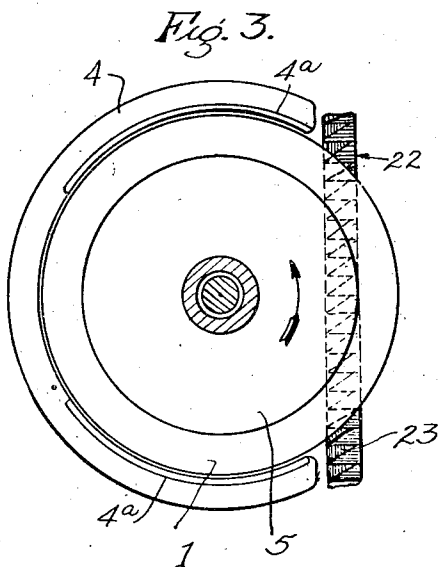


Fig. 3.

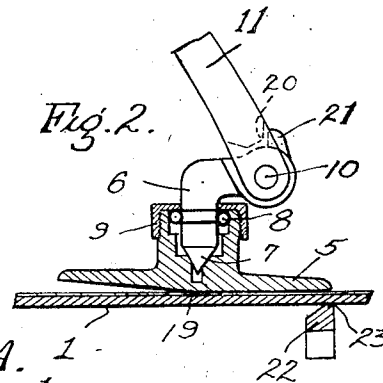


Fig. 2.

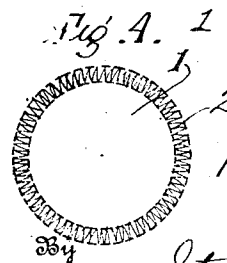


Fig. 4.

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FEEDING MECHANISM FOR SEWING MACHINES

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The invention relates to new and useful improvements in feeding mechanisms for sewing machines, and more particularly to a feeding mechanism for stitching or edging articles having a circular or arcuate configuration.

An object of the invention is to provide a feeding mechanism for positively directing the article to be stitched so that it turns about a fixed center, and for holding said article in a manner which permits the article to be fed step by step about said center by a feed dog moving in a right line.

A further object of the invention is to provide a feeding mechanism of the above character wherein the article being stitched is clamped at its center of rotation during the entire feed cycle, and wherein said clamping and directing device is capable of yielding in the region where the feed dog contacts with the article to accommodate the rising and falling movements of the feed dog.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawing which shows by way of illustration one embodiment of the invention:

Figure 1 is a front view of a portion of the machine embodying the improvements with the guide or placing member for the article being stitched in section.

Fig. 2 is a sectional view through the clamping member for holding and directing the article as it is fed step by step by the feeding mechanism.

Fig. 3 is a view partly in section and partly in plan showing the clamping and directing member, the guide for positioning the article to be stitched, and the feed dog in plan.

Fig. 4 is a view showing one form of article stitched on the improved device.

The invention is directed particularly to a feeding mechanism for sewing machines which is adapted for sewing disk-shaped articles such as powder-puffs or the like. Any form of stitching mechanism may be used for stitching the article, but it is preferred to use an overedge stitching mechanism which

will form overedge stitches, thus finishing the edge of the article.

An ordinary feeding mechanism including a four-motion feed dog is used for feeding the article, and this feed dog moves back and forth in a right line with the usual rising and falling movements. Associated with the feed dog is a member for clamping and directing the article being stitched. This clamping and directing member is shaped so as to conform to the shaping of the article to be stitched. It is mounted to turn about a vertical axis and also mounted so as to have a slight rocking movement. The under face of this clamping and directing member is cone-shaped with the apex of the cone centrally of the member. This apex of the cone becomes the center of rotation of the article being stitched. The clamping member is mounted on a bracket carried by the presser bar which has the usual yielding movement and is so arranged that the feed dog engages the article directly beneath the extreme peripheral edge portion of the clamping member. The serrated surface of the feed dog is preferably inclined on the face thereof adjacent the article and adjacent the clamping and directing device so that said feed dog will engage the article and move the same with certainty in its curved path of travel.

Referring more in detail to the drawing, in Fig. 4 there is shown an article, which is disk-shaped, and which has been stitched. This article is indicated at 1. The peripheral edge thereof is shown diagrammatically as covered with over-edge stitches indicated at 2. The machine includes a work support 3 which is provided with a guide or placing member 4 for placing the disk-shaped article so that its edge portion will be properly presented to the stitching mechanism, said guide member is provided with a centering flange 4a. The material is held on the work support by the improved clamping and directing member 5 which is attached to a supporting shaft 6 so that it can turn freely thereon. The shaft 6 has a tapered end 7, and a ball-bearing 8 is placed between said shaft and the hub of the clamping and directing disk. A cap plate 9 holds the parts

in their assembled position. This shaft 6 is provided with a lateral projecting portion which is pivoted at 10 to a bracket arm 11. The bracket arm 11 is in turn pivoted at 12 to an adjustable supporting member 13, this adjustable supporting member being carried by an arm 14 which is rigidly attached to the presser bar 15. The supporting member 13 is provided with slots 16, 16 and clamping screws 17, 17 hold the supporting member 13 in adjusted positions on the arm 14. This provides a means whereby the supporting member 13 may be moved either closer to or farther away from the presser bar 15. A spring latch 18 serves to hold the bracket arm in its normal position relative to the feed dog.

This supporting and directing disk 5 has its under face made cone-shaped, with the apex of the cone indicated at 19 centered relative to the axis of rotation of the disk on the shaft 6. There is a stop 20 on the bracket arm 11 and also a stop 21 on the laterally projecting portion carrying the shaft 6. When the support for the shaft 6 turns in a counterclockwise direction, these stops are brought into engagement. The main feed dog is indicated more or less diagrammatically at 22 in the drawing. This feed dog is the usual four-motion feed dog which rises into engagement with the material and then moves for feeding the material, after which it is moved from engagement with the material and returns for its next feed cycle.

As clearly shown in the drawing, the feed dog is serrated so as to form teeth 23 which engage the article for moving the same. The serrated face is inclined on the side thereof adjacent the disk so as to produce a limited line of contact with the article, and this line of contact, as clearly shown in Fig. 3, is substantially tangential to the clamping and directing disk 5. The article as shown in Fig. 3 projects beyond the disk and the feed dog. The presser foot 24 is adapted to engage the article at the stitching point and holds the article clamped against the plate 3 at the time when the needle is entering and leaving the same. This presser foot 24 is carried by a supporting bracket 25 attached to the bracket 11 carrying the clamping and directing disk 5. It is capable of adjustment laterally and vertically, and may be set so as to properly hold the fabric in the region of the stitching point during the stitch formation. It moves up, however, with the rocking movement of the directing disk so as to release the fabric sufficiently to permit it to be turned for positioning the same for the next stitch. The needle is indicated at 26 in the drawings.

The article to be stitched is placed relative to the stitching point by the placing or directing guide 4. The presser foot is lifted, raising the clamping and directing disk, so as to permit the placing of the article. When

the disk is lowered onto the article the apex of the cone surface of the disk engages the article at the center thereof and remains continuously in engagement with the center of the article, permitting it to turn with the clamping and directing plate so that the edge of the disk will be covered by stitches placed at a uniform distance from the center of the article. The clamping and directing disk will clamp the article all the way from the center of the disk to the edge thereof in a line at right angles to the line of feed passing through the stitching point at the time when the article is placed and the disk lowered onto the same. When the feed dog rising through the work further engages the article, it will lift the article from the work support and the clamping disk will be rocked on its apex as a center, lifting the bracket 11 and the presser bar and at this time the clamping disk will maintain its clamping pressure on the article at the center thereof and will also clamp the article against the feed dog at the peripheral edge of the disk. The feed dog being shaped as shown in the drawing makes substantially a line contact with the article at the tangential point of said disk, and thus it is that the feed dog will turn the directing disk, moving the article one step about the apex of the disk as a center, thus placing the article for the next stitching operation. The point where the article is clamped continuously against the cloth plate or the feed dog is at the tangential point of the line of feed with the peripheral edge of the disk which, as noted, is a line passing substantially through the stitching point and the center of the disk. The rocking movement of the disk on the bracket 11 is limited by the stops 20 and 21. When the presser foot is lifted and the bracket 11 raised therewith the disk rocks to a limited extent and remains substantially in a horizontal position. These stops, however, are so positioned as to permit the rising and falling movement of the peripheral edge of the disk at the line of feed. The upper faces of the feed dog are inclined as noted, so that when the disk lifts slightly at the peripheral edge thereof, still maintaining contact at the center, the line of contact between the feed dog and the article is still at the peripheral edge of the disk.

It will be apparent from the above description that a feeding mechanism has been provided for feeding and directing circular articles so that the edge thereof may be covered with stitches uniformly placed relative to the center of the article.

It is obvious that minor changes in detail of construction and arrangement of parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having fully described my invention,

what I claim as new and desire to secure by Letters Patent, is:—

1. A feeding mechanism for sewing machines including a feed dog, a cooperating clamping and directing member for causing the article being stitched to turn about a fixed center, said member being provided with a cone-shaped face adapted to contact with the article from the apex of the cone-shaped face to the periphery thereof and with the apex of said cone-shaped face at the center of the article.

2. A feeding mechanism for sewing machines including a feed dog, a cooperating clamping and directing member for causing the article being stitched to turn about a fixed center, said member being provided with a cone-shaped face adapted to contact with the article with the apex of said cone-shaped face at the center of the article, said feed dog having the feed engaging surface thereof tapered so as to restrict the extent of contact of the teeth of the feed dog with the fabric substantially to a line tangential with the clamping and directing member.

3. In a sewing machine the combination of a work support, a feeding mechanism including a feed dog, a clamping and directing member for clamping the article to be stitched against the work support and for directing the same in a circular path, the under face of said clamping and directing member being cone-shaped and bearing on said article in a line from the center thereof to the periphery of the article adjacent the stitching point.

4. In a sewing machine the combination of a work support, a feeding mechanism including a feed dog, a clamping and directing member for clamping the article to be stitched against the work support and for directing the same in a circular path, the under face of said clamping and directing member being cone-shaped and bearing on said article in a line from the center thereof to the periphery of the article adjacent the stitching point, said feed dog having the feed engaging surface thereof tapered so as to restrict the extent of contact of the teeth of the feed dog with the fabric substantially to a line tangential with the clamping and directing member.

5. In a sewing machine the combination of a work support, a feeding mechanism including a feed dog, a clamping and directing member for clamping the article to be stitched against the work support and for directing the same in a circular path, the under face of said clamping and directing member being cone-shaped and bearing on said article in a line from the center thereof to the periphery of the article adjacent the stitching point, and a presser foot engaging the article at the stitching point and adjacent the clamping and directing member for

clamping the same against the work support.

6. A feeding mechanism for sewing machines including a feed dog, a cooperating clamping and directing member for causing the article being stitched to turn about a fixed center, said member being provided with a cone-shaped face adapted to contact with the article from the apex of the cone-shaped face to the periphery thereof and with the apex of said cone-shaped face at the center of the article, and yielding means for supporting said clamping and directing member.

7. In a sewing machine the combination of a work support, a feeding mechanism including a feed dog, a clamping and directing member for clamping the article to be stitched against the work support and for directing the same in a circular path, the under face of said clamping and directing member being cone-shaped and bearing on said article in a line from the center thereof to the periphery of the article adjacent the stitching point, a presser foot engaging the article at the stitching point and adjacent the clamping and directing member for clamping the same against the work support, and a yielding member for supporting said clamping and directing member and said presser foot whereby the clamping member and presser foot may move up and down with the feed dog and may be simultaneously raised for the insertion of the article.

In testimony whereof, I affix my signature.
FRIEDRICH LUTZ.

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