Nov. 10, 1942. V. J. SIGODA 2,301,229

PINKING MECHANISM

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Fig. 1.

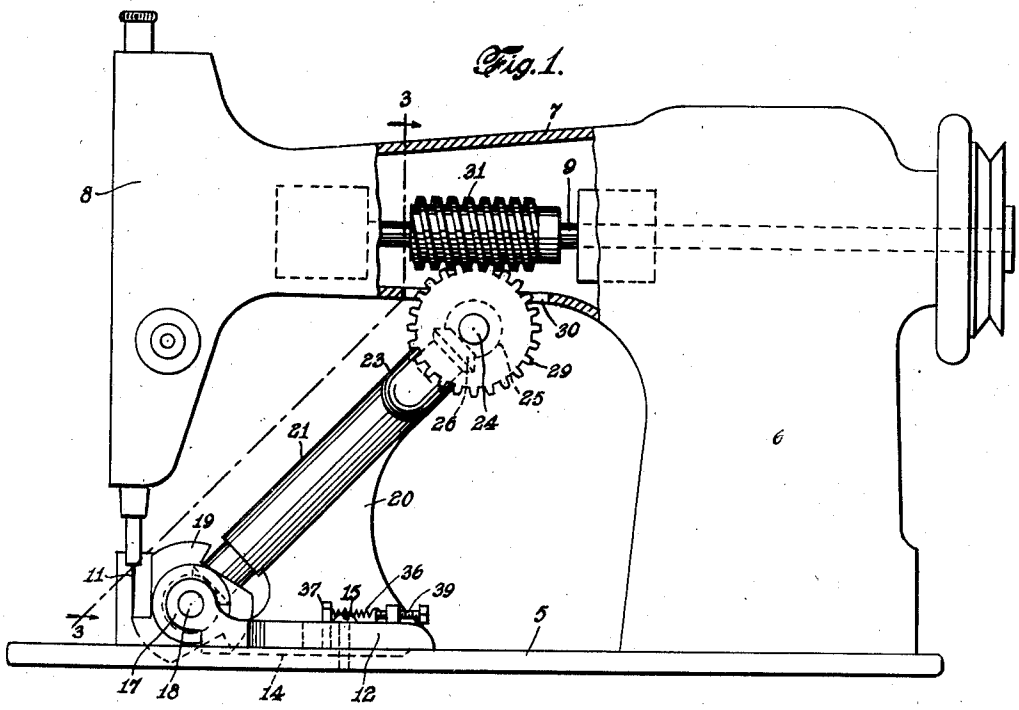


Fig. 2.

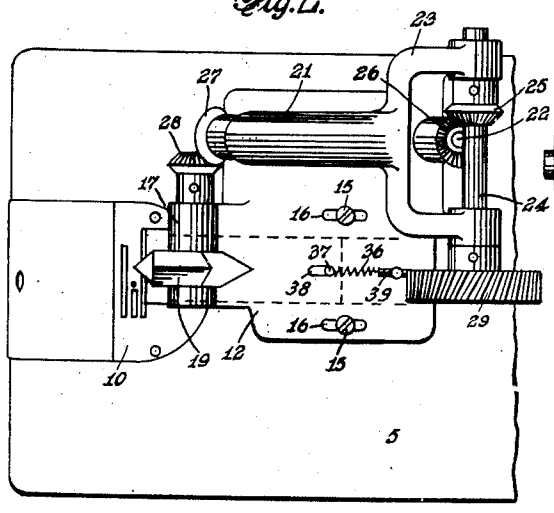


Fig. 3.

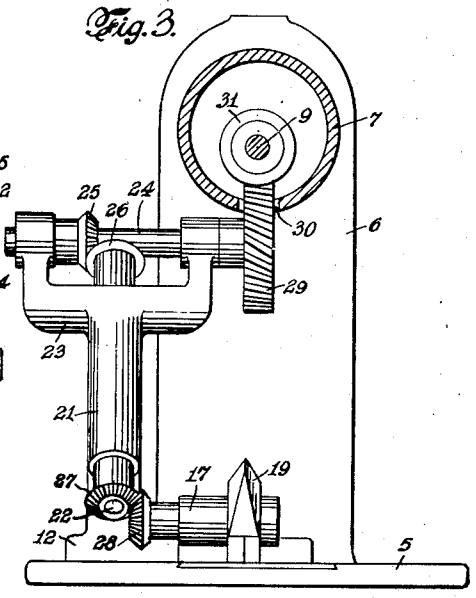
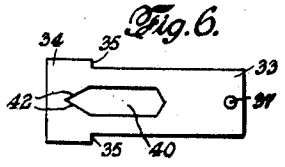


Fig. 6.



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Fig. 4.

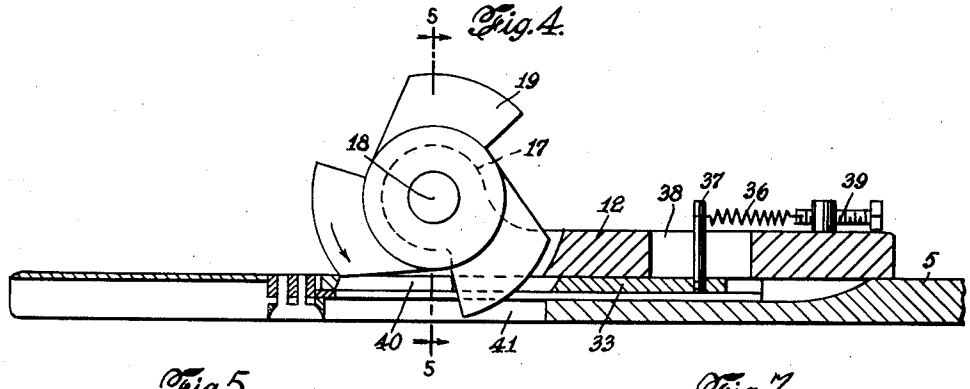


Fig. 5.

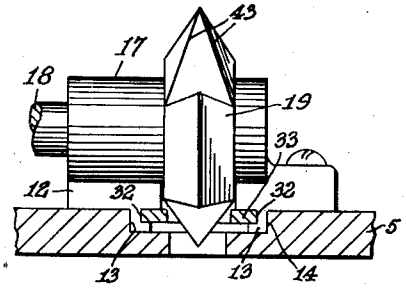


Fig. 7.

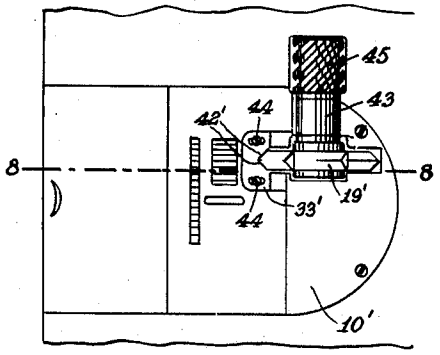


Fig. 9.

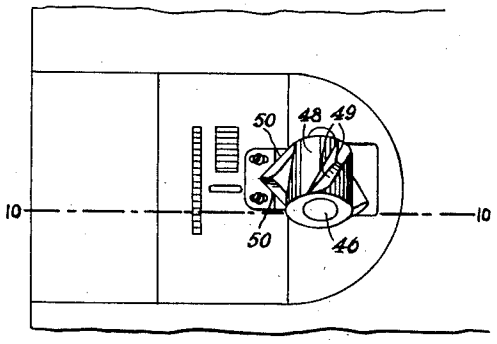


Fig. 8.

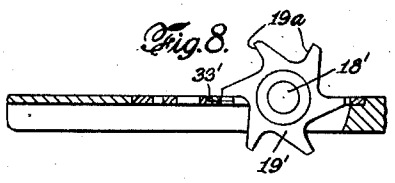
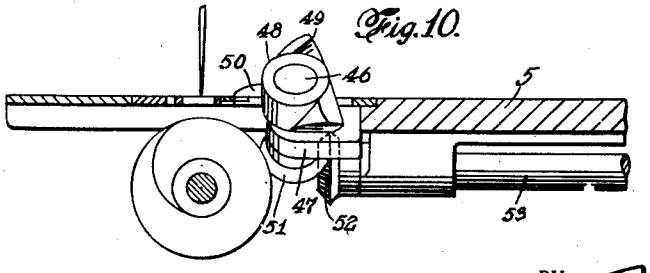


Fig. 10.



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UNITED STATES PATENT OFFICE

2,301,229

PINKING MECHANISM

Victor J. Sigoda, Great Neck, N. Y., assignor to Man-Sew Pinking Attachment Corporation, New York, N. Y., a corporation of New York

Application April 23, 1941, Serial No. 390,651

12 Claims. (Cl. 164—64)

This invention relates to pinking mechanism and has for its general object and purpose to provide a simply constructed and inexpensive device for ornamentally trimming or pinking the edges of fabric materials and which is of such construction that it may be readily applied to a standard sewing machine for operation in conjunction with the stitch forming mechanism, or may be used independently thereof.

It is a more particular object of the invention to provide a cutting or pinking member in the form of a multi-toothed element rotatable about a stationary axis and the teeth thereof having a cutting or chopping action upon the fabric material in cooperation with a shear plate mounted on the machine base.

In one embodiment of the invention, the rotatable pinking member is mounted upon a casting attached to the machine base, said casting supporting operating means for the cutter including a worm gear engaged with a worm on the needle operating shaft of a sewing machine, or other suitable power driven shaft.

Another object of the invention is to provide an improved mounting and arrangement of the shear plate on the bed of the machine whereby it is yieldingly urged into cooperative engagement with the cutting edges of the teeth of the rotary cutter. In other embodiments of the invention, I propose to mount the rotary cutter or chopper with its axis disposed in a horizontal plane which is substantially coincident with the plane of the upper surface of the bed plate of the machine, or I may position said axis of the cutting or trimming member at an oblique angle intersecting the plane of the bed plate and with the operating means for the cutter located wholly below said plate.

The subject matter of the present application is in part, a continuation of my pending application for patent Ser. No. 187,847, filed January 31, 1938, now Patent 2,239,743, granted April 29, 1941.

With the above and other objects in view, the invention consists in the improved pinking mechanism and in the form, construction and relative arrangement of its several parts as will be hereinafter more fully described, illustrated in the accompanying drawings and subsequently incorporated in the subjoined claims.

In the drawings wherein I have illustrated several simple and practical embodiments of my invention and in which similar reference characters designate corresponding parts throughout the several views:

Fig. 1 is a side elevation partly in section, showing one embodiment of the pinking mechanism as applied for use in connection with a sewing machine.

Fig. 2 is a top plan view of the pinking mechanism.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a vertical sectional view on an enlarged scale illustrating the cooperative mounting of the rotary pinking member and the shear plate upon the bed of the machine.

Fig. 5 is a vertical section substantially on the line 5—5 of Fig. 4.

Fig. 6 is a detail plan view of the shear plate.

Fig. 7 is a plan view showing a modified mounting of the rotary cutter member.

Fig. 8 is a sectional view taken substantially on the line 8—8 of Fig. 7.

Fig. 9 is a plan view similar to Fig. 7 showing a further modified construction, and,

Fig. 10 is a vertical sectional view taken substantially on the line 10—10 of Fig. 9.

Referring first to Figs. 1 to 6 of the drawings, in which I have illustrated one embodiment of the pinking mechanism mounted and arranged for use in connection with a sewing machine, 5 indicates the bed plate of the machine having the usual hollow pedestal 6 at one end thereof and the hollow arm 7 extending horizontally from the upper end of said pedestal. The end of this arm is provided with the customary guide head 8 for the vertically reciprocating needle bar and presser foot operating mechanism (not shown). The needle bar is operated by the power driven shaft 9 extending through the arm 7. Of course, the machine bed 5 is provided in its upper surface with the usual throat plate 10 and feed dog mechanism cooperating therewith to feed the fabric materials to the vertically reciprocating needle 11.

The pinking mechanism is mounted upon a casting having a base portion 12 provided on its bottom surface with the longitudinally extending ribs 13 slidably engaged in a channel 14 formed in the upper surface of the bed 5. The casting is adjustably secured in fixed relation to the bed 5 by means of the threaded bolts or screws 15 engaged in slots 16 in the base portion 12 of the casting.

At one end the base portion 12 is formed with suitable bearing means 17 for the shaft 18 to which the rotary pinking member or cutter 19 is suitably fixed. Adjacent one of its side edges the base 12 is formed with a vertically extending

web 20 integrally joined at its upper end with the obliquely inclined bearing sleeve 21 for a shaft 22. At its upper end the sleeve 21 is formed with a yoke 23 in which a transverse shaft 24 is rotatably supported. This shaft carries the beveled gear 25 meshing with a similar gear 26 on the upper end of shaft 22. The lower end of said shaft is provided with the gear 27 in mesh with gear 28 fixed to one end of the cutter shaft 18.

One end of the shaft 24 is provided with the worm gear 29 which, in the illustrated arrangement, is adapted to extend upwardly through a slot 30 in the lower side of the machine arm 7 to mesh with the teeth of the worm 31 fixed to the power driven shaft 9.

The inner sides of the ribs 13 on the base 12 are grooved as at 32 to receive the longitudinal edge portions of slidable shear plate 33. This plate has a relatively wide end portion 34 movable in a recess in the upper surface of the throat plate 10 and providing stop shoulders 35 for abutting contact with the base 12 to limit movement of the shear plate to a normal position. The plate is yieldingly held in such normal position by the spring 36 attached at one of its ends to a pin 37 fixed to the shear plate and movable in the slot 38 in the base 12. The other end of said spring is attached to the adjustable screw 39 mounted on the base, whereby the resistance offered by said spring to sliding movement of the shear plate may be varied.

The shear plate 33 is provided with an elongated opening 40 registering with a similar opening 41 in the machine bed 5 to receive the teeth of the cutter 19. At one end of the opening 40, the converging cutting edges 42 are provided to coact with the cutting edges 43 of the individual teeth of the cutter 19 so as to produce a triangularly shaped pinking cut. It will be evident that the spring 36 yieldingly urges the edges 42 of the shear plate towards the cutting edges of the teeth of the cutter 19, and depending upon the thickness of the material, there will be a slight longitudinal yielding motion of the shear plate. This insures a sharp shearing cut, and uniform depth of the pinking cuts.

From the above description, the operation of this embodiment of the invention will be readily understood. As the sewing machine is operated, rotation is transmitted to the cutter 19 through the worm gearing and the shafts 24 and 22. The pinking device is adjusted on the bed 5 so as to position the cutter in predetermined relation to the edge of the material fed to the sewing machine needle 11. The path of rotation of the cutter is at right angles to the edge of the material so that the individual cutter teeth in cooperation with the shear plate 33 have a chopping action. The cutter teeth are so spaced, and its speed of rotation is properly predetermined relative to the action of the feed mechanism so that the V-shaped pinking cuts are produced in regular succession in the edge of the fabric. By adjusting the pinking device on the bed plate 5, the depth of the pinking cuts and their spaced relation from the line of stitching may be regulated as desired.

In Figs. 7 and 8 of the drawings I have shown a modified construction, in which the cutter shaft 18' is mounted with its axis disposed substantially coincident with the plane of the upper surface of the machine bed. As illustrated, I show said cutter shaft supported in a suitable bearing 43 formed on the throat plate 10'. In this case, the cutter 19' fixed to said shaft has a relatively large number of teeth, each of which has its cutting edges 19a disposed in a common plane which intersects the axis of the shaft 18'. The cutter 19' is operable through an opening in the throat plate and at one end thereof the shear plate 33' is counter-sunk in the upper surface of the throat plate and adjustable with relation to the teeth of the cutter 19' by the screws 44 threaded in the throat plate and extending through slots in the shear plate. This shear plate is provided with the cutting edges 42' which correspond with the shape or form of the teeth of cutter 19'. One end of the shaft 18' is provided with a worm 45 for connection with any suitable driving means mounted upon the machine bed.

In Figs. 9 and 10, I have illustrated another alternative construction in which all of the operating gearing for the cutter is mounted wholly beneath the bed plate of the machine while at the same time a minimum of projection of said cutter above the surface of the bed plate is obtained. In this case the axis of the cutter shaft 46 is disposed at an angle of substantially 30° with respect to the plane of said plate, and, as herein shown, is journaled in a suitable bearing 47 on the under side of the throat plate. One end of said shaft intersects the plane of the throat plate and to the same the cutter 48 is suitably fixed. This cutter is provided with a plurality of spaced triangularly shaped cutting teeth 49 which are spirally arranged upon the periphery of the cutter so that their cutting edges 50 are respectively positioned in a plane intersecting the axis of the cutter and shaft 46 at an oblique angle. Therefore, as the teeth 49 successively approach the shear plate and engage the fabric, they will be disposed with their cutting edges in a horizontal plane to properly cooperate with the cutting edges of the shear plate and thus insure a clean sharp pinking cut.

Upon the lower end of the obliquely inclined cutter shaft 46 a gear 51 is fixed and in constant mesh with a similar gear 52 on one end of the cutter drive shaft 53. It will thus be seen that the major portion of the cutter shaft 46, the drive gearing therefor and one-half of the cutter 48 are disposed entirely below the plane of the upper surface of the bed plate of the machine so that a very minimum of obstructive parts to the vision or movement of the worker's hands in guiding or directing the work is made possible.

In each of the above described embodiments of the invention, it will be understood that the cutter elements may be of any desired size or diameter and provided with a greater or less number of cutting teeth than illustrated in the drawings. It will also be seen that said pinking mechanisms are readily adaptable to use in connection with a standard sewing machine so that two or more plies of fabric may be stitched together and simultaneously pinked, or the said mechanism may be independently employed to pink the edges of the fabric plies before or after the sewing or stitching operation. In the latter case, it will, of course, be evident that the use of the throat plate may be dispensed with and the shear plate mounted directly on the machine bed. Also, while I have herein referred to several practical embodiments of my improved pinking mechanism and described the same in more or less detail, the essential features of the invention may also be incorporated in various other structural forms and other relative arrangements of the several cooperating elements, without materially affect-

ing the functional operation and advantageous results of the mechanism as herein described. Accordingly, it is to be understood that I reserve the privilege of adopting all such legitimate changes in the form, construction and relative arrangement of the various parts as may fairly be considered to be within the spirit and scope of the appended claims.

I claim:

1. In mechanism for edge-pinking fabrics, a multi-toothed cutter mounted to rotate in a vertical plane with the teeth thereof movable in a path which intersects the plane of the fabric at an angle of substantially 90°.

2. In mechanism for edge-pinking fabrics, a multi-toothed cutter mounted to rotate in a vertical plane with the teeth thereof movable in a path which intersects the plane of the fabric at an angle of substantially 90°, and a shear member yieldably coacting with the cutting edges of the teeth of said rotatable cutter.

3. In mechanism for edge-pinking fabrics, a multi-toothed cutter mounted to rotate in a vertical plane with the teeth thereof movable in a path which intersects the plane of the fabric at an angle of substantially 90°, a movable shear plate having an opening receiving the cutter teeth and provided with cutting edges at one end of said opening to coact with the cutting edges of said teeth, and means yieldingly resisting relative movement of the shear plate and urging the cutting edges thereof into coacting relation with the teeth of the rotatable cutter.

4. In mechanism for edge-pinking fabrics, a supporting base, a multi-toothed cutter rotatably mounted on said base in intersecting relation thereto and with the cutting teeth movable in a vertical plane which intersects the plane of the fabric at an angle of substantially 90°, and drive means for the cutter mounted on said base including a driven element adapted for operative connection with a power driven member.

5. In mechanism for edge-pinking fabrics, in combination with a bed plate over which the fabric moves in a rectilinear path, a supporting structure, means for adjustably mounting said structure on the bed plate for movement towards and from the path of movement of the fabric, a multi-toothed cutter mounted upon said supporting structure to rotate in a vertical plane with the teeth thereof movable in a path which intersects the plane of the bed plate and the edge of the fabric at an angle of substantially 90°, drive means for the cutter mounted upon said supporting structure and including a worm gear, and a power driven worm in mesh with said worm gear.

6. In mechanism for edge-pinking fabrics, a supporting base over which the fabric is adapted to be moved in a rectilinear path, a cutter shaft and means for mounting said shaft upon said base, and a toothed cutter fixed to said shaft having spaced teeth movable in a path at an intersecting angle relative to the path of movement of the edge of the fabric.

7. In mechanism for edge-pinking fabrics, a supporting base over which the fabric is adapted to be moved in a rectilinear path, a cutter shaft and means for mounting said shaft on the base with its axis substantially coincident with the plane of the upper surface of the base, and a toothed cutter fixed to said shaft having spaced teeth movable in a path which intersects the edge of the fabric at an angle of substantially 90° with respect thereto.

8. In mechanism for edge-pinking fabrics, a supporting base over which the fabric is adapted to be moved in a rectilinear path, a cutter shaft and means for mounting said shaft upon said base, and a toothed cutter fixed to said shaft having spaced teeth movable in a path at an intersecting angle relative to the path of movement of the edge of the fabric, each of the cutter teeth having spaced cutting edges disposed in a common plane intersecting the axis of the cutter shaft.

9. In mechanism for edge-pinking fabrics, a base, a multi-toothed cutter mounted upon said base for rotation about an obliquely inclined axis and in intersecting relation to the plane of said base, the teeth of said cutter each having cutting edges disposed in a plane obliquely intersecting the axis of rotation of the cutter.

10. A rotatable cutter for fabric trimming devices having circumferentially spaced cutting teeth each provided with a plurality of cutting edges disposed in a plane intersecting the axis of the cutter at an angle thereto.

11. A rotatable cutter for fabric trimming devices having circumferentially spaced cutting teeth spirally inclined relative to the cutter axis.

12. A rotatable cutter for fabric trimming devices having circumferentially spaced cutting teeth spirally inclined relative to the cutter axis, and each tooth having spaced cutting edges disposed in a common plane obliquely intersecting the cutter axis.

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