Feb. 6, 1962 L. BONO 3,019,750

FEED DEVICE FOR A SEWING-MACHINE

Filed March 18, 1958

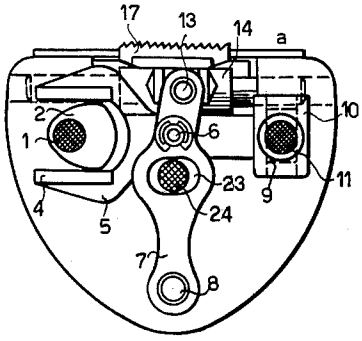

FIG. 3

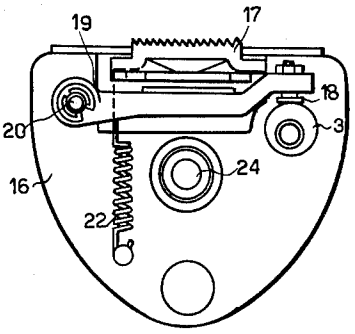

FIG. 2

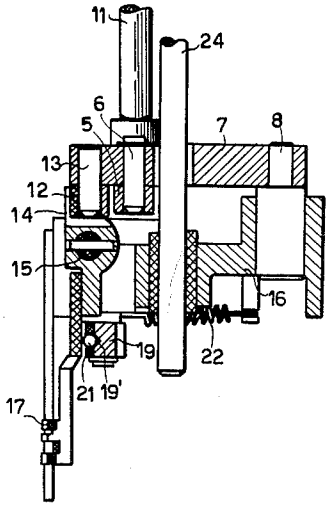

FIG. 4

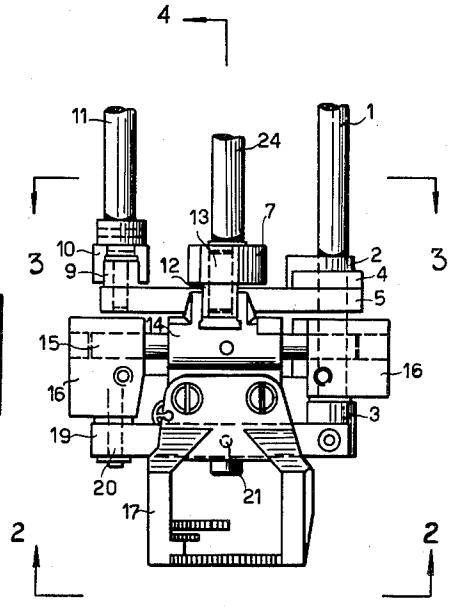

FIG. 1

INVENTOR.
Luigi Bono

BY

Michael S. Striker
Attorney

United States Patent Office

3,019,750

Patented Feb. 6, 1962

3,019,750

FEED DEVICE FOR A SEWING-MACHINE

Luigi Bono, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy, a firm

Filed Mar. 18, 1958, Ser. No. 722,168
Claims priority, application Italy Apr. 12, 1957
12 Claims. (Cl. 112—215)

Object of the present invention is a mechanical feeding unit for a sewing-machine.

As it is known the base plate of the sewing-machine has under the needle an opening through which protrudes a feed member provided with teeth. The feed member performs a composite movement along a rectangular path composed of rising, moving forward, going down and moving backwards.

Generally these movements are controlled by two distinct kinematic synchronized actuating means driven from the rotating main shaft of the machine, so that by means of cams or eccentrics the continuous rotary motion is transformed into oscillatory movements. Such movements, suitably in phase coincidence, are transmitted by means of shafts to the feed dog, which is thus operated to move along a rectangular path.

The device of the present invention directly actuates the feed dog, completely eliminating intermediate shafts. In this manner the unit functions very precisely and obtains a perfect seam.

Besides, due to its compact construction, it is particularly suitable for sewing sleeves, stockings etc.

The following description refers to the appended drawings in which

FIG. 1 is a plan view of the feed device.

FIG. 2 is a sectional view taken on line 2—2 of FIG. 1.

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

FIG. 4 is a longitudinal sectional view taken on line 4—4 of FIG. 1.

The movement of the unit is obtained from a shaft **1**, performing a continuous rotating movement, and driven by means not shown in the figures.

Said shaft carries two cams **2** and **3**. Cam **2** causes the horizontal motion of feed dog and cam **3** causes its rising and sinking movement.

Cam **2** acts inside a fork **4**, on one end of lever **5**, and moves said lever in an oscillatory up and down movement. Lever **5** is fulcrumed at about half of its length on a pivot **6** on a vertical lever **7**, which is fulcrumed on a fixed pivot **8**.

Lever **5** pivotally supports on its other end the guide block **9** which is slidable in a guide **10** on shaft **11**, which can be manually rotated and set in a selected position in order to obtain the regulation of the stitch length and of the feeding direction. The regulation is obtained by angularly displacing the trajectory of guide block **9** in guide **10**. Such angular rotations of guide **10** with respect to vertical *a* cause longitudinal motions of lever **5** during its oscillation, thus displacing pivot **6** and consequently lever **7** with respect to its middle position shown in FIG. 3.

These reciprocating motions cause an oscillation of lever **7**, whose amplitude corresponds to the inclination of guide **10** with respect to the vertical. Besides, the oscillation will be influenced by placing the same end of guide **10** on different sides of a vertical plane *a*.

The oscillatory motion of lever **7** is directly transmitted to feed member **17** through slide **12** mounted on lever **7** by means of pivot **13**. The slide actuates a bearing block **14** engaged thereby and consequently shifts feed dog **17** which is secured to block **14**. Nevertheless the latter can rotate about the axis of pivot **15** on which it is mounted for sliding movement in axial direction of the same together with block **14**.

Block **14** and therefore feed dog **17** can therefore be displaced along the axis of pivot **15** while able to rotate about the axis of the same pivot.

Such rotation is utilized to obtain the up and down movement of feed dog **17** by means of eccentric cam **3** which acts on small adjustable plate **18** connected with the end of lever **19**, which has its journal **20** on the base plate of the machine.

At about the middle of lever **19** a ball **21** is turnably mounted in a longitudinal slot **19'** of lever **19** and contacts the bottom face of feed member **17** to transmit the rising movement to the same. The downward movement of feed dog **17** is obtained by return spring **22**.

Consequently, lever **7**, actuated by lever **5**, directly operates feed dog **17** in its forwards and backwards movement.

As it is shown in FIG. 3, the vertical lever **7** is provided with an opening **23** through which passes shaft **24** actuating the "shuttle," not shown in the drawing.

One embodiment has been described as an example and variations of the form, the dimensions, the material and the assembly of the various members should be considered the limits of the present invention as defined in the claims.

I claim:

1. Feeding mechanism for a sewing machine, comprising, in combination, supporting means; a feed member; means for mounting said feed member on said supporting means for angular rocking movement about a first axis and for reciprocating feeding movement in direction of said first axis; means operatively connected to said feed member for reciprocating the same in direction of said first axis; a driven cam means rotatable in one direction; lever means extending parallel to said first axis and being mounted on said supporting means for angular movement about a second axis, said lever means being operatively connected to said rotary cam means to be rocked about said second axis, said lever means supporting said feed member for movement therealong in said direction of said first axis so that said feeding member is rocked by said lever means when the same is rocked by said cam means, while being supported by said lever means during movement in said direction of said first axis.

2. Feeding mechanism for a sewing machine, comprising, in combination, supporting means; a feed member having a workpiece engaging portion; means for mounting said feed member on said supporting means for angular rocking movement about a first axis spaced from said workpiece engaging portion and for reciprocating feeding movement in direction of said first axis; means operatively connected to said feed member for reciprocating the same in direction of said first axis; a driven cam means rotatable in one direction; lever means extending parallel to said first axis and being mounted on said supporting means for angular movement about a second axis transverse to said first axis, said lever means being operatively connected to said rotary cam means to be rocked about said second axis, said lever means supporting said workpiece engaging portion of said feed member for movement therealong in said direction of said first axis so that said feeding member is rocked by said lever means when the same is rocked by said cam means, while being supported by said lever means during movement in said direction of said first axis.

3. Feeding mechanism for a sewing machine, comprising, in combination, supporting means; a feed member means for mounting said feed member on said supporting means for angular rocking movement about a first axis and for reciprocating feeding movement in direction of said first axis; a first cam means rotatable in one direction and operatively connected to said feed member

for reciprocating the same in direction of said first axis; a second cam means rotatable in one direction; lever means extending parallel to said first axis and being mounted on said supporting means for angular movement about a second axis transverse to said first axis, said lever means being operatively connected to said second rotary cam means to be rocked about said second axis, said lever means supporting said feed member for movement therealong in said direction of said first axis so that said feeding member is rocked by said lever means when the same is rocked by said lever means when the same is rocked by said second cam means, while being supported by said lever means during movement in said direction of said first axis.

4. Feeding mechanism for a sewing machine, comprising, in combination, supporting means; a feed member means for mounting said feed member on said supporting means for angular rocking movement about a first axis and for reciprocating feeding movement in direction of said first axis; a drive shaft rotatable in one dierction; a first cam means and a second cam means secured to said drive shaft for rotation with the same in said one direction, said first cam means being operatively connected to said feed member for reciprocating the same in direction of said first axis; lever means extending parallel to said first axis and being mounted on said supporting means for angular movement about a second axis transverse to said first axis, said lever means being operatively connected to said second rotary cam means to be rocked about said second axis, said lever means supporting said feed member for movement therealong in said direction of said first axis so that said feeding member is rocked by said lever means when the same is rocked by said second cam means, while being supported by said lever means during movement in said direction of said first axis.

5. Feeding mechanism for a sewing machine, comprising, in combination, supporting means; a feed member; a supporting shaft mounted on said supporting means and supporting said feed member for angular rocking movement about a first axis and for reciprocating movement therealong in direction of said first axis; a first cam means rotatable in one direction and operatively connected to said feed member for reciprocating the same in direction of said first axis; a second cam means rotatable in one direction; lever means extending parallel to said first axis and being mounted on said supporting means for angular movement about a second axis transverse to said first axis, said lever means being operatively connected to said second rotary cam means to be rocked about said second axis, said lever means supporting said feed member for movement therealong in said direction of said first axis so that said feeding member is rocked by said lever means when the same is rocked by said second cam means, while being supported by said lever means during movement in said direction of said first axis.

6. Feeding mechanism for a sewing machine, comprising, in combination, supporting means; a feed member having a workpiece engaging portion; a supporting shaft mounted on said supporting means and supporting said feed member spaced from said workpiece engaging portion for angular rocking movement about a first axis and for reciprocating movement therealong in direction of said first axis; a drive shaft rotatable in one direction; a first cam means and a second cam means secured to said drive shaft for rotation with the same in said one direction, said first cam means being operatively connected to said feed member for reciprocating the same in direction of said first axis; a driven cam means rotatable in one direction; lever means extending parallel to said first axis and being mounted on said supporting means for angular movement about a second axis transverse to said first axis, said lever means being operatively connected to said second rotary cam means to be rocked about said second axis, said lever means supporting said workpiece engaging portion of said feed member for movement therealong in said direction of said first axis so that said feeding member is rocked by said lever means when the same is rocked by said second cam means, while being supported by said lever means during movement in said direction of said first axis.

7. Feeding mechanism for a sewing machine, comprising, in combination, supporting means; a feed member having a workpiece engaging portion; means for mounting said feed member on said supporting means for angular rocking movement about a first axis spaced from said workpiece engaging portion and for reciprocating feeding movement in direction of said first axis; a rocking member mounted on said supporting means for angular movement about a rocking axis extending transverse to said first axis, said rocking member being operatively connected to said feed member for reciprocating the same in direction of said first axis; first driven cam means rotatable in one direction and operatively connected to said rocking member for rocking the same about said rocking axis; second driven cam means rotatable in one direction; lever means extending parallel to said first axis and being mounted on said supporting means for angular movement about a second axis transverse to said first axis, said lever means being operatively connected to said second rotary cam means to be rocked about said second axis, said lever means supporting said workpiece engaging portion of said feed member for movement therealong in said direction of said first axis so that said feeding member is rocked by said lever means when the same is rocked by said second cam mean, while being supported by said lever means during movement in said direction of said first axis.

8. Feeding mechanism for a sewing machine, comprising, in combination, supporting means; a feed member having a workpiece engaging portion; means for mounting said feed member on said supporting means for angular rocking movement about a first axis spaced from said workpiece engaging portion and for reciprocating feeding movement in direction of said first axis; a rocking member mounted on said supporting means for angular movement about a rocking axis extending transverse to said first axis, said rocking member being operatively connected to said feed member for reciprocating the same in direction of said first axis; a driven shaft rotatable in one direction and having an axis transverse to said first axis; a first cam means and a second cam means secured to said drive shaft for rotation with the same in said one direction, said first cam means being operatively connected to said rocking member for rocking the same about said rocking axis; lever means extending parallel to said first axis and being mounted on said supporting means for angular movement about a second axis transverse to said first axis, said lever means being operatively connected to said second rotary cam means to be rocked about said second axis, said lever means supporting said workpiece engaging portion of said feed member for movement therealong in said direction of said first axis so that said feeding member is rocked by said lever means when the same is rocked by said second cam means, while being supported by said lever means during movement in said direction of said first axis.

9. A feeding mechanism as set forth in claim 8 and including a guide member mounted on said support means turnable for adjustment about an axis parallel to said second axis; a lever having fulcrumed on said rocking member and having on one end thereof a slide member guided in said guide means, said lever having the other end thereof forked and engaged by said first cam means and rocked by said first cam means so that said lever is reciprocated in longitudinal direction thereof while said one end thereof is displaced in said longitudinal direction by said slide member sliding in such guide member whereby said rocking member is rocked about such rocking axis.

10. Feeding mechanism for a sewing machine comprising, in combination, a supporting means; a feed mem-

ber; guide means mounted on said supporting means for turning movement; means for mounting said feed member on said supporting means for angular rocking movement about a horizontal axis and for reciprocating movement in direction of said horizontal axis; a drive shaft; two cam means secured to said drive shaft; two lever means extending parallel to said axis, each of said lever means being in direct operative connection with one of said cam means; the first of said lever means being horizontally fulcrumed to said supporting means and slidingly engaging said feed member for effecting angular rocking movements of said feed member about said horizontal axis; the second of said lever means having one pivot slidably engaging said guide means and being operatively connected to said feed member for reciprocating feeding movement of said feed member.

11. Feeding mechanism for a sewing machine comprising, in combination, a supporting means; a feed member; guide means mounted on said supporting means for turning movement; means for mounting said feed member on said supporting means for angular rocking movement about a horizontal axis and for reciprocating movement in direction of said horizontal axis, a drive shaft; two cam means secured to said drive shaft; two lever means extending parallel to said axis, each of said lever means means being in direct operative connection with one of said cam means; the first of said lever means being horizontally fulcrumed to said supporting means and slidingly engaging said feed member for effecting angular rocking movement of said feed member about said horizontal axis; the second of said lever means having one pivot engaged on guide sliding means fulcrumed to said supporting means; a third lever means pivotally connected to said second lever means and fulcrumed to said supporting means and being in operative sliding engagement with said feed member.

12. Feeding mechanism for a sewing machine comprising, in combination, a supporting means; a feed member;

means for mounting said feed member on said supporting means for angular rocking movement about a horizontal axis and for reciprocating movement in direction of said horizontal axis; a horizontal rotatable drive shaft perpendicular to said axis; two cam means secured to said drive shaft; two lever means extending parallel to said axis, each of said lever means being in direct operative connection with one of said cam means; the first of said lever means being horizontally fulcrumed to said supporting means perpendicularly to said axis and slidingly engaging said feed member for effecting angular rocking movement of said feed member about said horizontal axis; the second of said lever means having one pivot; an orientatable guide means horizontally fulcrumed to said supporting means perpendicularly to said axis and being fulcrumed, said pivot of said second lever being guided in said guide means, a third lever means pivotally connected to said second lever means and being fulcrumed to said supporting means and being in operative sliding engagement with said feed member, the point of sliding contact between said feed member and said first lever means and the connection between said feed member and said second lever means being disposed on opposite sides of said axis.

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