

PFAFF® **438**

Service Manual

PFAFF INDUSTRIEMASCHINEN GMBH KAISERSLAUTERN

Instructions for Adjusting the Pfaff 438

and Illustrated Guide for Tape-Recorded Instructions

The machine we had in mind in drawing up the following instructions is a machine which has been repaired, but still needs adjusting.

I Note: Never use a needle rise gauge on the Pfaff 438 because its needle bar might be damaged by the C-clamp of the gauge.

Tools, Gauges and Accessories Required for Adjusting the Pfaff 438

- 1 set of screwdrivers with blades from 2--10 mm wide
- 1 set of wrenches from 7--14 mm
- 1 set of allen screw wrenches in sizes from 2--6 mm
- 1 cylindrical pin, 32 mm long, 5 mm dia. No. 13-030 341-05
- 1 feed dog gauge, Order No. 91-129 995-05
- 1 hook bearing bracket gauge, Order No. 91-129 996-05
- 1 wrapper with System 438 needles, No. 80
- 2 strips of white paper
- 1 reel of adhesive tape
- sewing thread

1. Preparations for Adjusting

1.1 Determining the Different Needle Positions (Fig. 1)

1.1.1 The bearing plate at the needle bar end of the machine has four holes, which, in conjunction with a 5-mm pin, determine the different needle positions.

1.1.2 **Hole 1** = Needle rise position 2 mm (abt. $\frac{5}{64}$ ") above the bottom of the needle bar stroke

1.1.3 **Hole 2** = Top of needle bar stroke

1.1.4 **Hole 3** = 0,25 mm (abt. .01") past the highest point of the needle bar stroke

1.1.5 **Hole 4** = 1 mm (.04") past the highest point of the needle bar stroke

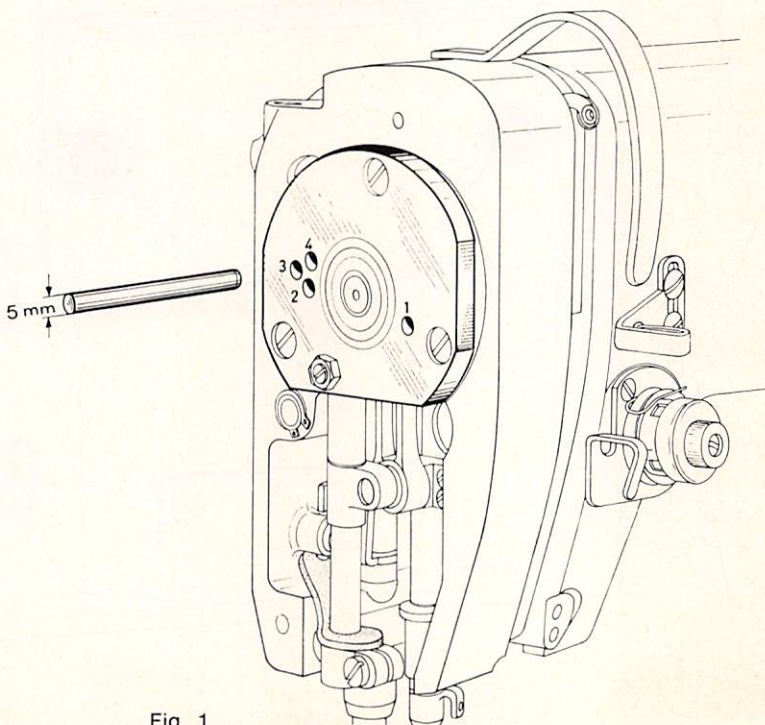


Fig. 1

1.2 Removing the Cast-Iron Cover (Fig. 2)

- 1.2.1 Turn out screws 5 of the cast iron cover on the back of the machine arm and remove the cover.
- 1.2.2 Take up the oil in the needle vibrating eccentric housing with a sponge or remove it with a vacuum pump.

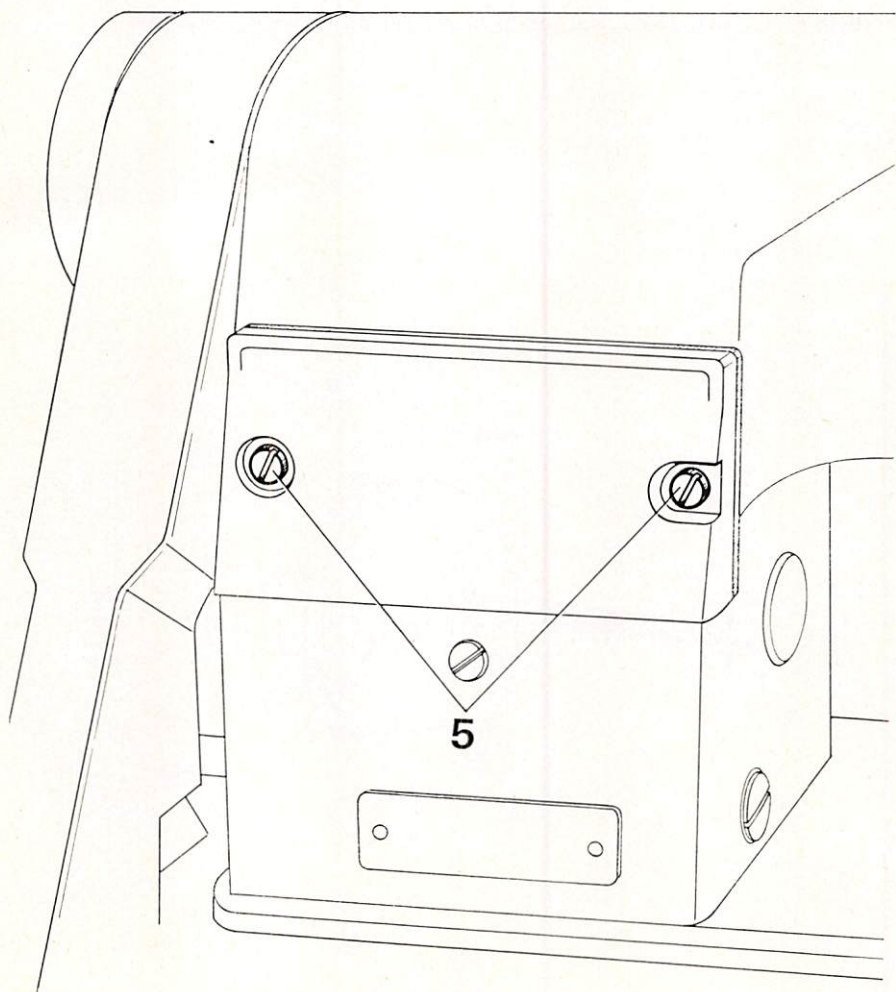


Fig. 2

1.3 Removing Various Parts before Adjusting the Needle Bar (Fig. 3)

- 1.3.1 Turn out screw **6** of the presser foot and remove the presser foot.
- 1.3.2 Turn out screw **7** of the thread guide, too, and remove the thread guide.
- 1.3.3 Loosen screw **8** of the slack thread control and remove the thread slack control from the presser bar bushing by pulling it downwards.
- 1.3.4 Turn out the three allen screws **9** of the cover on the underside of the machine arm and remove the cover.
- 1.3.5 Insert a new System 438 needle and push it up as far as it will go.

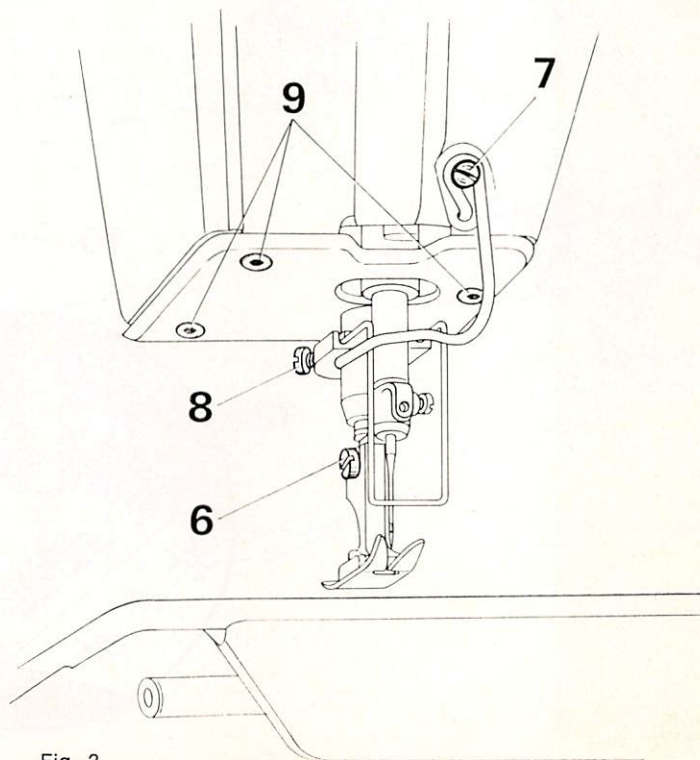


Fig. 3

2. **Centering the Needle in the Needle Hole in Sewing Direction** (Fig. 4)
- 2.1 Bring the needle bar to its lowest position.
 - 2.2 Loosen jam nut **10**.
 - 2.3 Loosen allen screw **11** at the bottom of the needle bar frame.
 - 2.4 Turn eccentric stud **12** on the right-hand side of the machine arm until the needle is centered in the needle hole in sewing direction.
 - 2.5 In this position tighten allen screw **11** as well as jam nut **10** firmly.

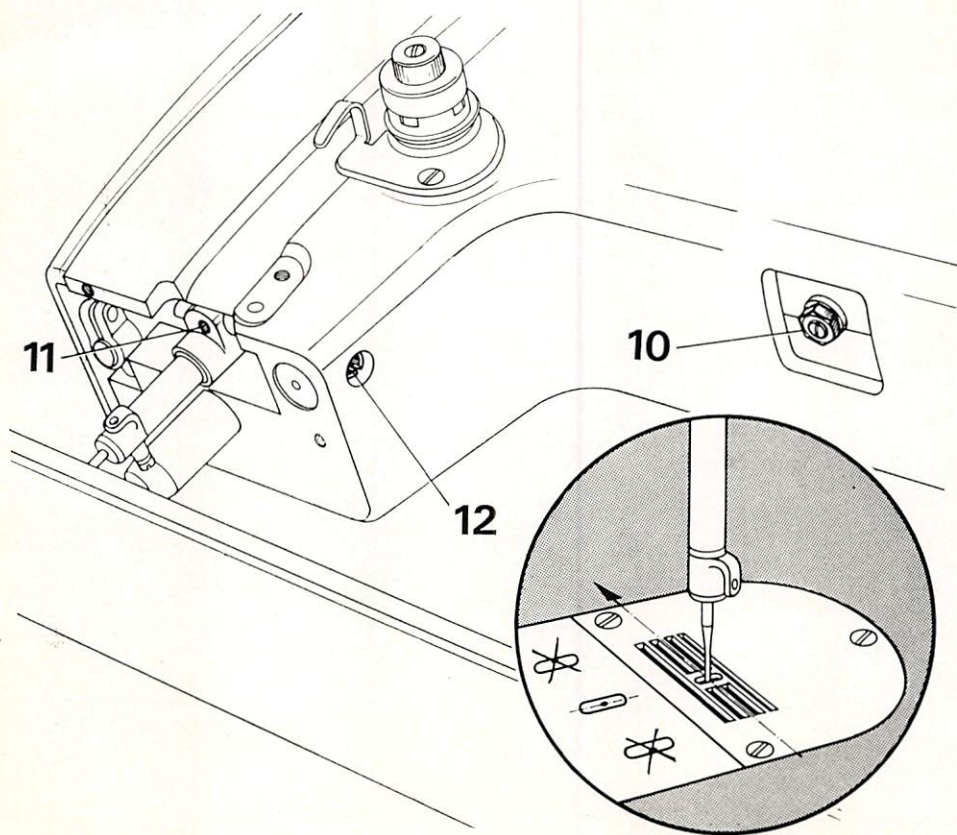


Fig. 4

- 3. Setting the Stabilizing Rod Parallel to the Needle Bar (Fig. 5)**
- 3.1 Remove the face cover.
 - 3.2 Raise the needle bar to its highest point.
 - 3.3 Block the machine in this position by inserting the 5-mm cylindrical pin in hole 2 of the bearing plate.
 - 3.4 Loosen clamp screw **15** at the bottom end of the stabilizing rod.
 - 3.5 Loosen screw **18** (accessible from the back of the machine arm) which secures clamp crank **19** in the machine arm.
 - 3.6 Then loosen jam nut **16**.
 - 3.7 Turn eccentric stud **17** to set stabilizing rod **13** parallel to the needle bar. Be careful that you don't turn the eccentric stud by 180 degrees.
 - 3.8 Hold eccentric stud **17** in this position and tighten jam nut **16** securely.
 - 3.9 Push up stabilizing rod **13** as far as it will go, making sure that the eccentric stud enters the recess at its top end (see arrow in Fig. 5) and tighten clamp screw **15** on clamp crank **19** securely.
 - 3.10 Remove the cylindrical pin from the bearing plate.
 - 3.11 Bring the needle bar to its lowest point and tighten screw **18** on the back of the machine firmly.

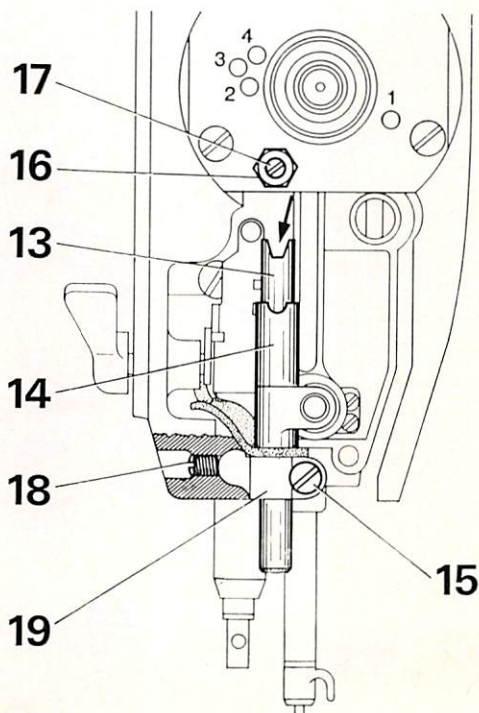
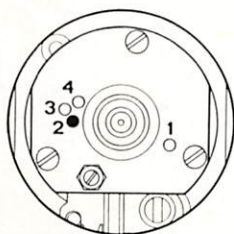


Fig. 5

4. Adjusting the Stitch Width Control

4.1 Zeroing the Needle for Straight Stitching (Fig. 6)

- 4.1.1 Flick needle position lever **20** to its central position.
- 4.1.2 Loosen straight-stitch regulating screw **23** and stop screw **24** for limiting the maximum stitch width.
- 4.1.3 Loosen clamp screw **26** of locking lever **22** and let lever **22** swing back until its spring is completely relaxed.
- 4.1.4 In this position, tighten clamp screw **26** again.
- 4.1.5 Move stitch width lever **21** counter-clockwise as far as it will go, that means towards "0".
- 4.1.6 Turn on the master switch and let the machine run slowly. Move stitch width lever **21** to the left until the needle bar stops swinging sideways.
- 4.1.7 In this position, push straight-stitch regulating screw **23** to the right as far as it will go and tighten it.

4.2 Adjusting the Stitch Width Scale (Fig. 6)

- 4.2.1 Move stitch width lever **21** to the right as far as it will go.
- 4.2.2 Loosen both screws **25** of the stitch width scale.
- 4.2.3 Adjust the scale until the zero mark on the scale is opposite the mark on the flange of the stitch width lever.
- 4.2.4 In this position, tighten both screws **25** of the scale securely.

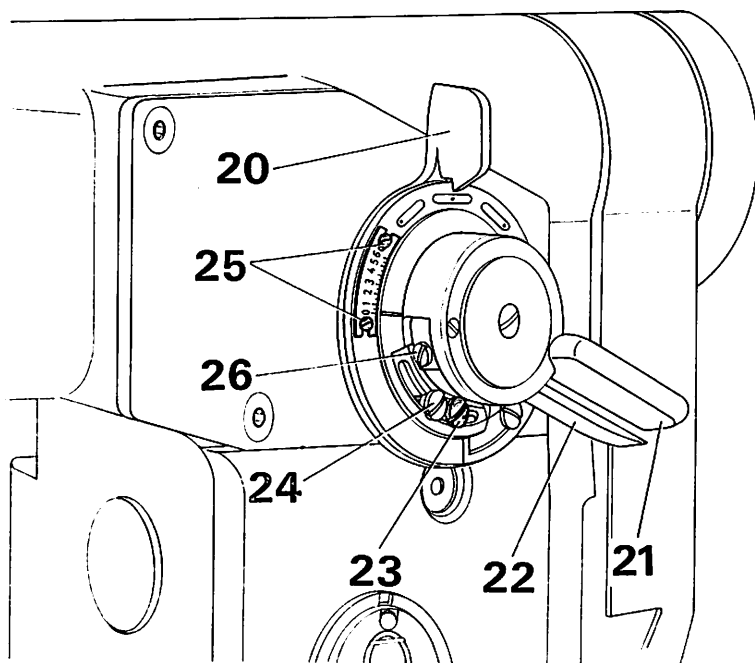


Fig. 6

4.3 Limiting the Maximum Stitch Width (Fig. 7)

- 4.3.1 Move stitch width lever **21** to the left until the mark on its flange is opposite the mark indicating the maximum stitch width on the scale.
- 4.3.2 Move stop screw **24** which limits the maximum stitch width to the left as far as it will go and tighten it.

If for certain sewing operations your machine should have been equipped with a needle plate whose hole is smaller than the widest needle throw, limit the stitch width according to the width of the needle hole rather than the graduation mark on the stitch width scale.

4.4 Adjusting the Locking Lever (Fig. 7)

- 4.4.1 Loosen clamp screw **26** of locking lever **22**.
Make sure the pressure spring in the locking lever does not fall out.
- 4.4.2 Pull locking lever **22** forward until it contacts stitch width lever **21**.
- 4.4.3 In this position, turn hinge stud **27** in or out until locking lever **22** has just the right amount of play. Then tighten clamp screw **26** securely.

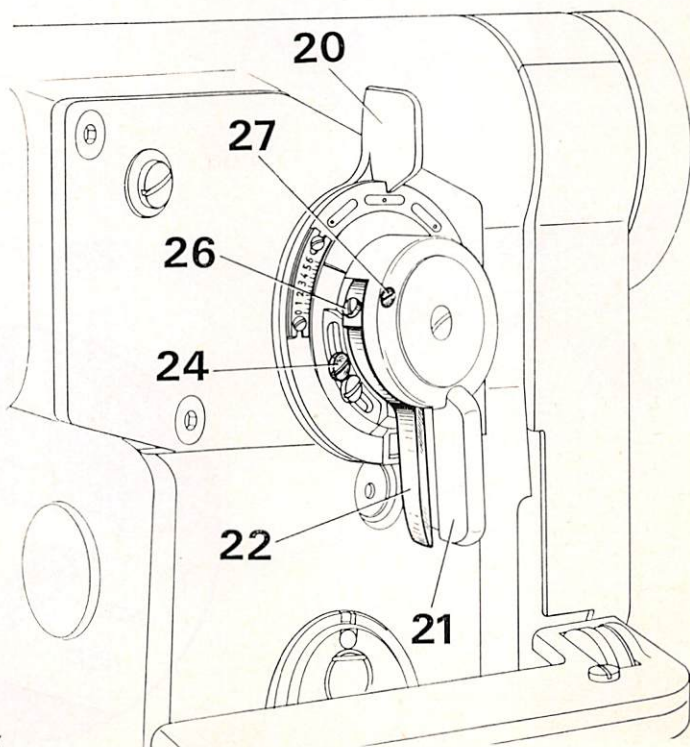


Fig. 7

5. **Adjusting the Needle in the Needle Hole Sideways (Fig. 8)**

- 5.1 Make sure that the stitch width lever is still in its central position and the stitch width lever is turned to "0".
- 5.2 Bring the needle bar to its lowest position.
- 5.3 Loosen jam nut **10** of eccentric stud **28** on the underside of the machine arm.
- 5.4 Now turn eccentric stud **28** until the needle is centered in the needle hole sideways.
- 5.5 Retain eccentric stud **28** in this position and tighten jam nut **10** firmly.

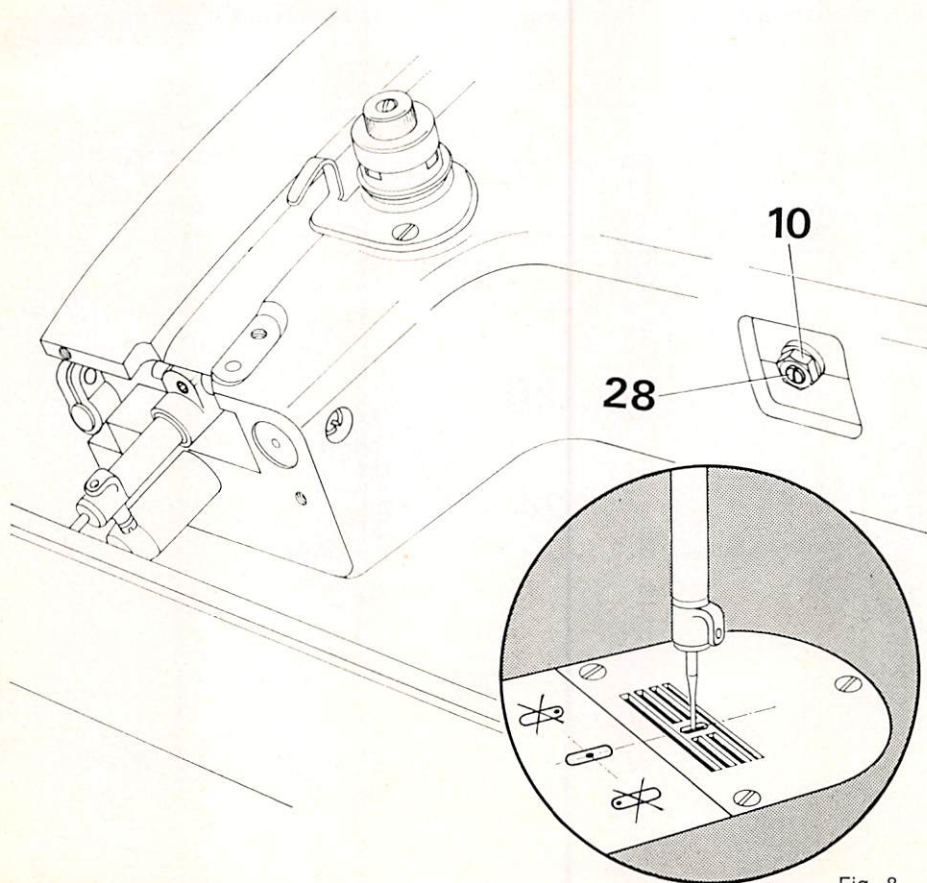


Fig. 8

6. **Adjusting the Needle Throw** (Fig. 9)

- 6.1 Loosen both screws **29** of the needle vibrating eccentric just sufficiently to permit the eccentric to be turned on its shaft against strong resistance.
- 6.2 Bring the needle bar to its highest point. Insert the 5-mm pin in hole **2** of the bearing plate, thus blocking the machine with the needle bar in its highest position.
- 6.3 Move the eccentric on its shaft until there is a clearance of about 5.0 mm (or $\frac{3}{16}$ ") between its right-hand side and the wall of the casting.
- 6.4 Turn the eccentric on its shaft until the needle bar ceases vibrating while the stitch width lever is moved to and fro.
- 6.5 Pull the cylindrical pin out of the bearing plate.
- 6.6 Do **not** tighten screws **29** of the needle vibrating eccentric yet.

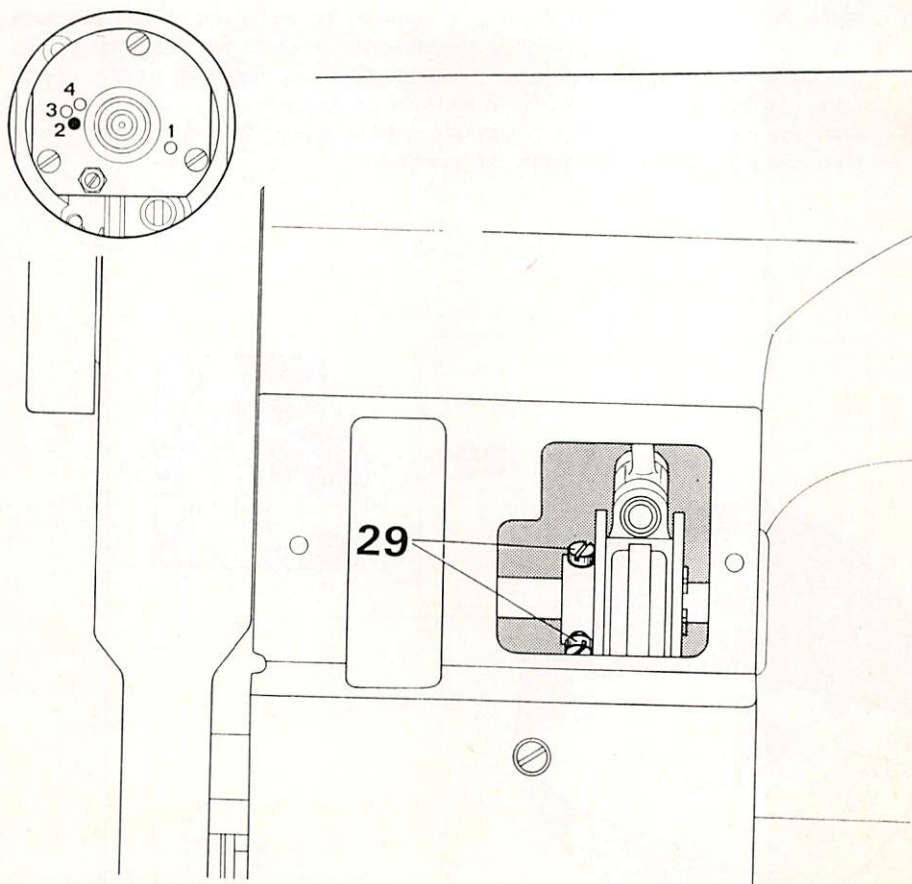


Fig. 9

7. Adjusting the Needle Throw in Relation to the Central Needle Puncture (Fig. 10)

- 7.1 Move the needle position lever to its central position and the stitch width lever to "0".
- 7.2 Place a piece of white paper under the needle. Turn the balance wheel in sewing direction until the needle has pierced the paper slightly and then raise the needle a little.
- 7.3 Hold the paper in its original position and turn the stitch width lever to the maximum stitch width.
- 7.4 Rotate the balance wheel in its normal direction of rotation until the needle has stitched into the paper again.
- 7.5 Remove the paper from under the needle, turn the balance wheel in sewing direction one complete turn and flick the stitch width lever back to "0".
- 7.6 Place the paper under the needle again and position it so that the needle enters the first hole.
- 7.7 Turn the stitch width lever to the widest stitch and let the needle stitch into the paper again.
- 7.8 Since the two screws **29** of the needle vibrating eccentric are still loose, move the eccentric slightly on its shaft in the direction in which the two outer needle punctures must be moved in order to obtain a symmetrical stitch pattern. (Don't rotate the eccentric while moving it endwise on its shaft.)
- 7.9 After you have completed the adjustment, tighten screws **29** and push the circlip (see arrow in Fig. 10) up against the eccentric.

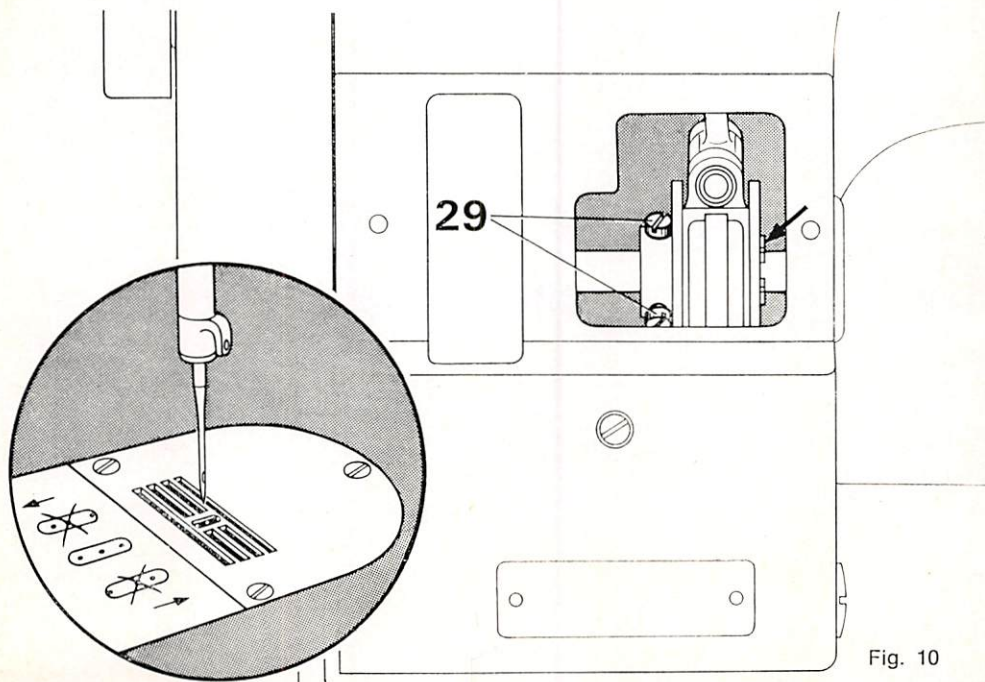


Fig. 10

8. Adjusting the Needle Position Lever

8.1 Fixing the Left Needle Position (Fig. 11)

- 8.1.1 Loosen both needle position limiting screws **30** and **31**.
- 8.1.2 Turn needle position lever **20** to its central position and flick stitch width lever **21** to the maximum stitch width.
- 8.1.3 Turn the balance wheel in sewing direction until the descending needle is positioned above the left end of the needle hole.
- 8.1.4 Place a piece of white paper over the needle hole and fix it to the machine with adhesive tape.
- 8.1.5 Turn the balance wheel in sewing direction until the needle has stitched into the paper lightly.
- 8.1.6 Turn stitch width lever **21** to "0" and push needle position lever **20** to the left until the point of the needle is positioned right above the needle puncture in the paper.
- 8.1.7 Push needle position limiting screw **30** up against its stop and tighten it firmly. Leave limiting screw **31** loose, however.

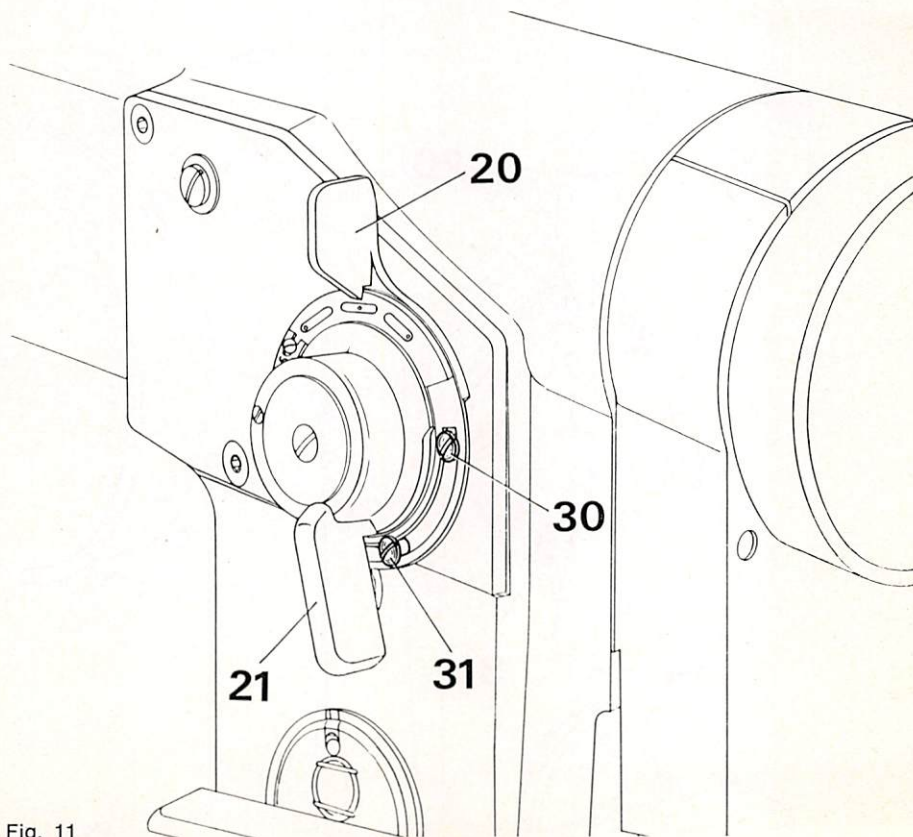


Fig. 11

8.2 Fixing the Right Needle Position (Fig. 11)

- 8.2.1 Flick needle position lever **20** to its central position and turn stitch width lever **21** to the maximum stitch width.
- 8.2.2 Rotate the balance wheel in sewing direction until the descending needle is positioned above the right end of the needle hole.
- 8.2.3 Turn the balance wheel in sewing direction until the needle has again stitched into the paper lightly.
- 8.2.4 Turn stitch width lever **21** to "0" and push needle position lever **20** to the right until the point of the needle is positioned above the needle puncture made last.
- 8.2.5 Push needle position limiting screw **31** against its left stop and tighten it securely.

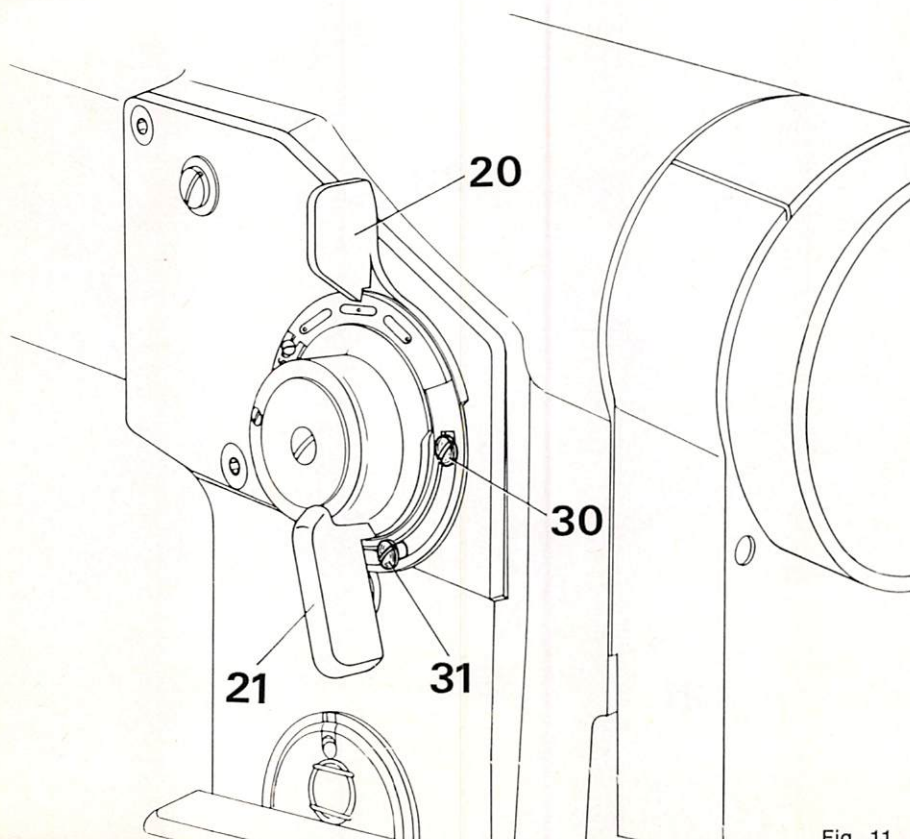


Fig. 11

9. **Adjusting the Stitch Length Scale Ring (Fig. 12)**
- 9.1 Loosen the scale ring screw (see arrow).
- 9.2 Turn the stitch length dial next to the scale ring in the direction in which the reverse-feed control is caused to move downwards, turning it **as far as it will go**.
- 9.3 Turn the scale ring so that its "0" mark is exactly in line with the graduation mark on the reverse-feed control.
- 9.4 In this position tighten the scale ring screw firmly.

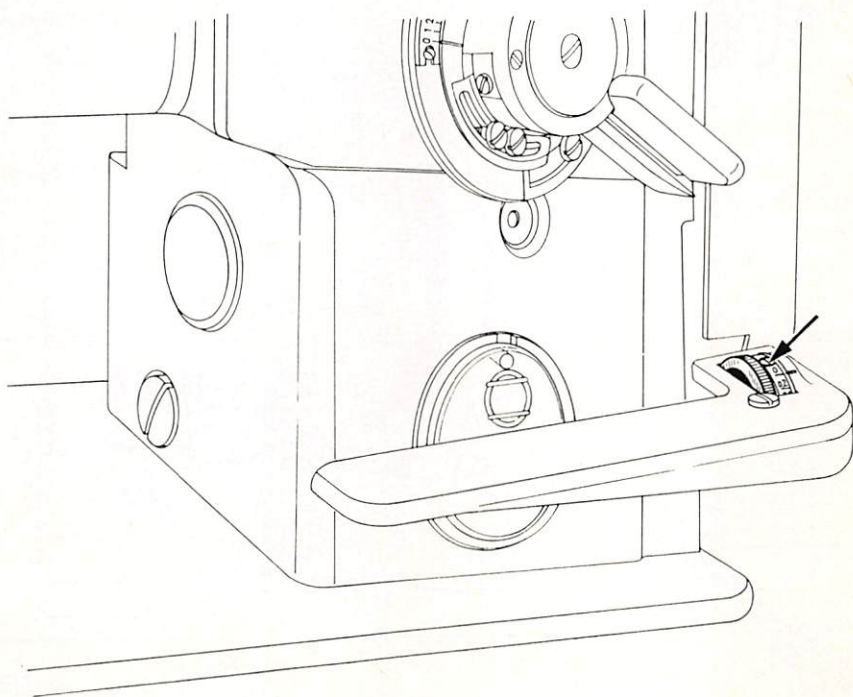


Fig. 12

10. Zeroing the Feed Motion (Fig. 13)

- 10.1 Unscrew the gear case cover, making sure that any oil that might run out is collected and the foam-plastic pad is removed.
- 10.2 Turn the stitch length dial to "0".
- 10.3 Loosen both clamp screws **32** on the feed regulating crank.
- 10.4 Rotate the feed regulating crank on its shaft until the feed rock shaft crank makes no perceptible movement when you turn the balance wheel.
- 10.5 In this position, tighten both clamp screws **32** of the feed regulating crank.

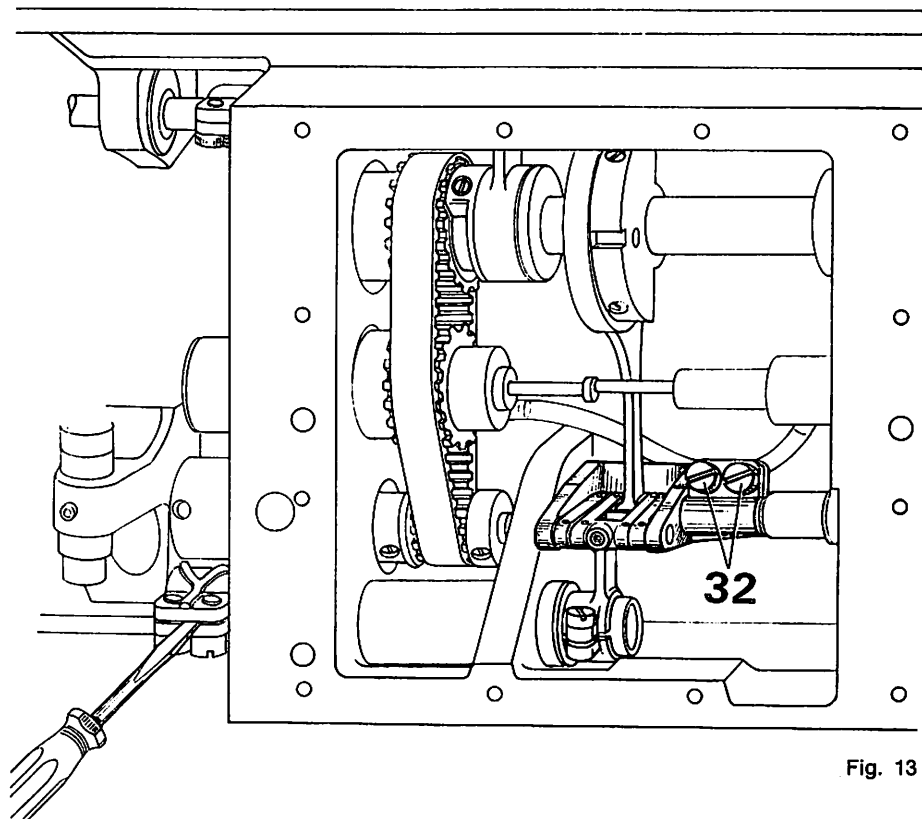


Fig. 13

11. Adjusting the Feed Driving Motion (Fig. 14)

- 11.1 Loosen both screws **33** on the feed driving eccentric just sufficiently to permit the eccentric to be turned on its shaft against strong resistance.
- 11.2 Rotate the balance wheel until the needle bar is positioned about 1.0 mm ($\frac{3}{64}$ ") past its highest point.
- 11.3 To block the machine in this position, insert the cylindrical pin in hole **4** of the bearing plate.
- 11.4 Set the machine for its longest stitch.
- 11.5 Turn the feed driving eccentric on its shaft until its notch points forward.
- 11.6 Continue turning the feed driving eccentric until the feed rock shaft crank remains completely motionless when the reverse-feed control is moved up and down.
- 11.7 Hold it in this position, making sure that the feed driving eccentric does not become wedged sideways and tighten one of the screws **33**.
- 11.8 Turn the stitch length dial to "0".
- 11.9 Pull the cylindrical pin out of the hole in the bearing plate and tighten the second feed driving eccentric screw firmly.

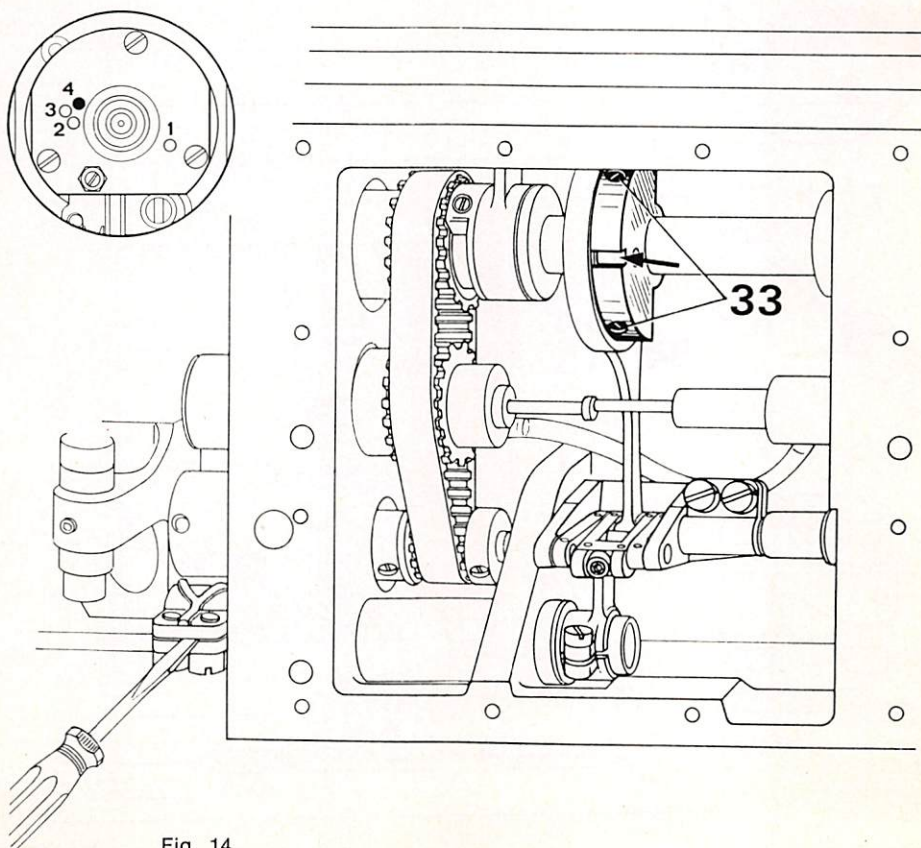


Fig. 14

12. Adjusting the Feed Lifting Motion (Fig. 15)

- 12.1 Turn the stitch length dial to "0".
- 12.2 Loosen both screws **34** of the feed lifting eccentric.
- 12.3 Turn the balance wheel until the needle bar has reached a point 0.25 mm (.01") past the top of its stroke and retain it in this position by inserting the cylindrical pin in hole **3** of the bearing plate.
- 12.4 Rotate the feed lifting eccentric on its shaft until the feed lifting shaft crank is at its lowest point.
- 12.5 Keep it in this position and tighten the accessible screw **34** of the feed lifting eccentric, making sure that the two discs are up against the feed lifting connection.
- 12.6 Remove the cylindrical pin from the bearing plate and tighten the second screw of the feed lifting eccentric.

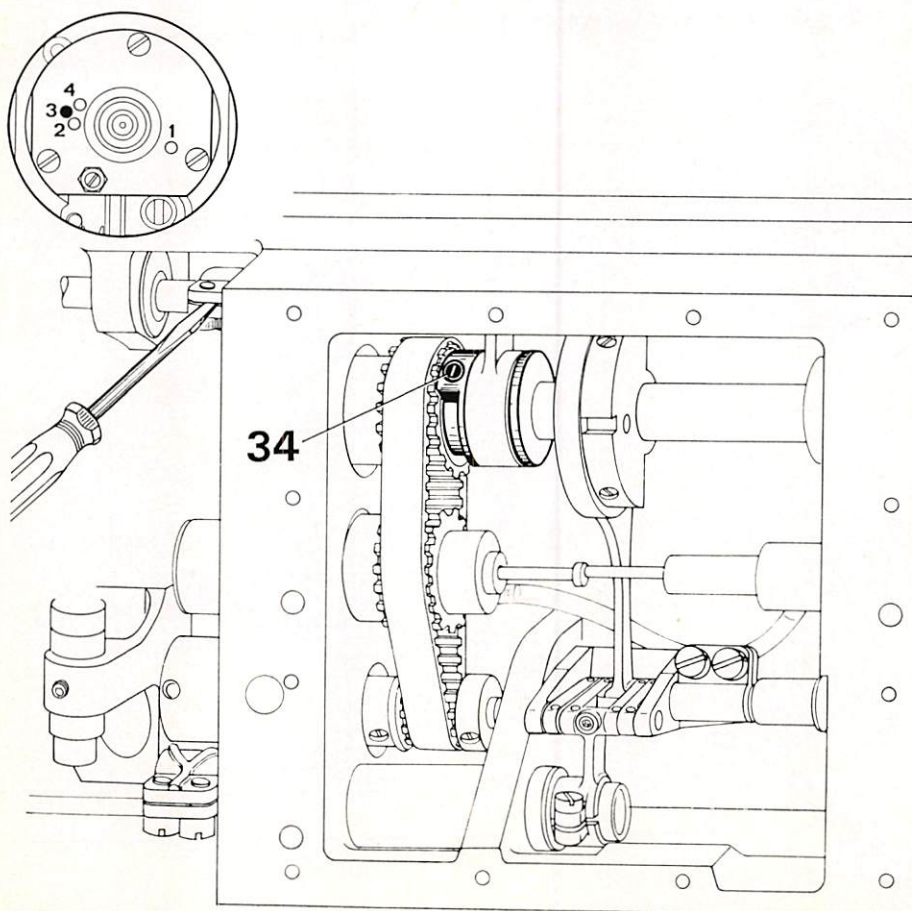


Fig. 15

13. Setting the Presser Foot at the Correct Height (Fig. 16)

- 13.1 Replace the cover on the underside of the machine arm and tighten the three allen screws.
- 13.2 Push the slack thread control on the presser bar bushing so that it will not be struck by the needle bar when it has reached its lowest point and tighten its set screw.
- 13.3 Screw on the presser foot as well.
- 13.4 Lower the needle into the needle hole and make sure the needle position lever is in its central position and the stitch width lever points to "0".
- 13.5 Loosen clamp screw **35** which is partly concealed in the front part of the machine.
- 13.6 Raise the presser foot and push the feed dog gauge under it.
- 13.7 Raise the presser bar lifter.
- 13.8 Adjust the presser foot sideways so that the needle is centered in the needle slot exactly.
- 13.9 Push the presser bar lifting bracket downwards as far as it will go and tighten clamp screw **35**. Then remove the gauge from under the presser foot.
(There should now be a clearance of 7.0 mm (abt. $\frac{9}{32}$ ") between the presser foot and the needle plate).

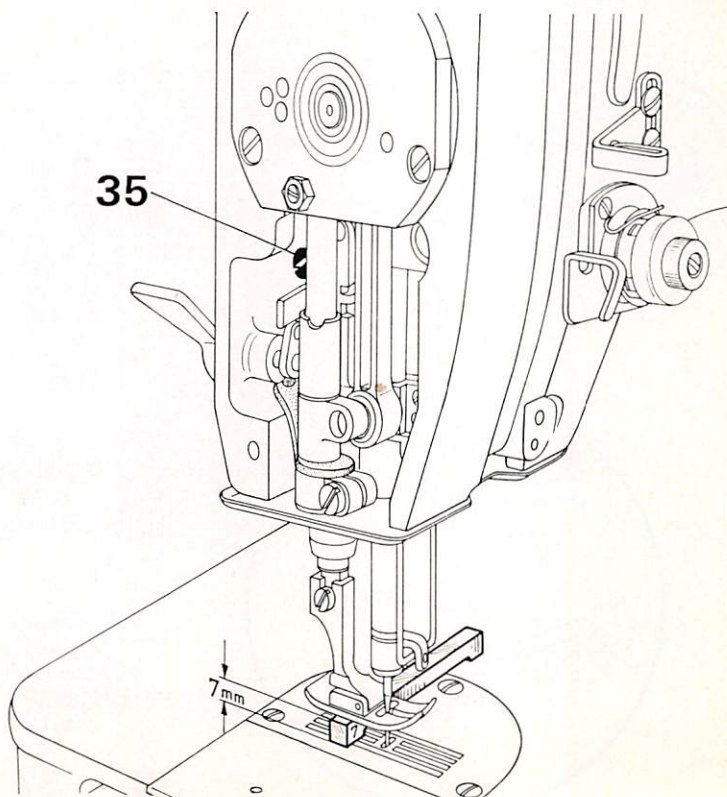


Fig. 16

14. Adjusting the Feed Dog (Fig. 17)

- 14.1 Turn the balance wheel until the needle bar has reached a position 0.25 mm (.01") past its highest point and block the machine by inserting the cylindrical pin in hole 3 of the bearing plate.
- 14.2 Set the stitch length dial on "0".
- 14.3 Loosen both clamp screws 36 on the feed lifting shaft crank.
- 14.4 Loosen both clamp screws 37 on the feed rock shaft crank, too.
- 14.5 Place the feed dog gauge so under the presser foot that both its ends are in line with the front and rear edges of the needle plate. Lower the presser bar lifter to let the presser foot down on the feed dog gauge.
- 14.6 Center the feed dog in the feed slot lengthwise.
- 14.7 Turn the feed lifting shaft crank until the feed dog is up against the underside of the gauge.
- 14.8 Turn eccentric bushing 38 below the feed rock shaft crank until the feed dog is set parallel to the underside of the feed dog gauge.
- 14.9 Tighten both clamp screws 37 of the feed rock shaft crank securely.
- 14.10 Also tighten both clamp screws 36 of the feed lifting shaft crank, making sure that the feed dog still contacts the gauge.
- 14.11 Remove the feed dog gauge from under the presser foot and pull the cylindrical pin out of the bearing plate.

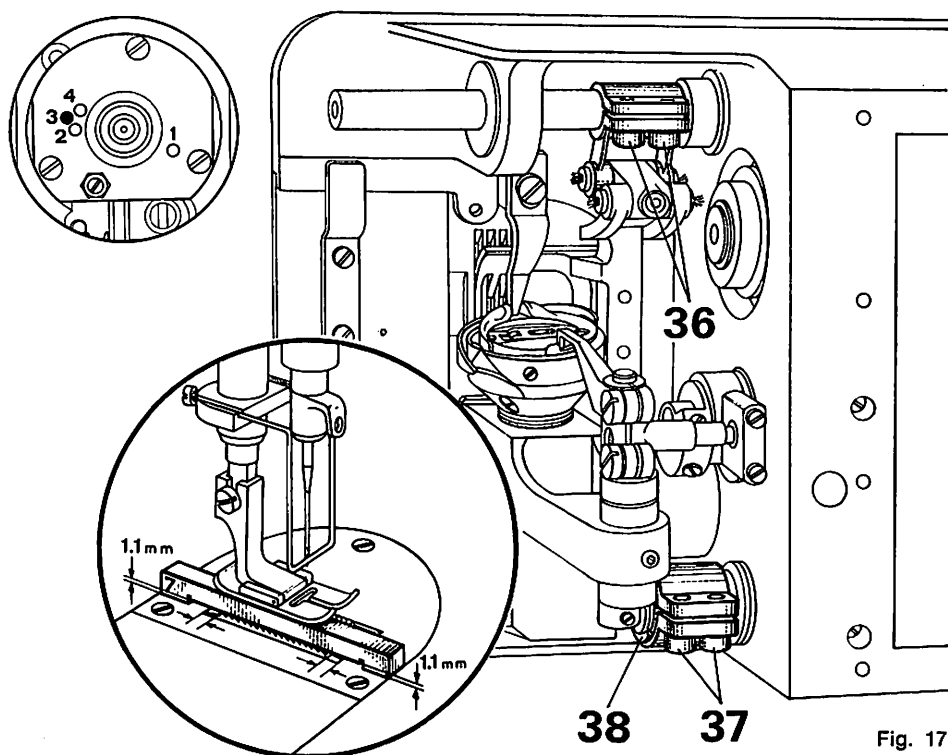


Fig. 17

- 15. Adjusting the Hook Bearing Bracket (Fig. 18)**
- 15.1 Loosen the clamp screw on the bobbin case opener and swing the latter to the right.
 - 15.2 Strip the bobbin case position finger.
 - 15.3 Loosen the two hook set screws and pull the sewing hook off its shaft.
 - 15.4 Unscrew the bed slide and remove it.
 - 15.5 Remove the needle plate and the feed dog as well.
 - 15.6 Loosen allen screw 39 on the bedplate (see circle in Fig. 18) and release the taper key of the hook bearing bracket underneath this screw by tapping the head of the allen screw lightly with a hammer.
 - 15.7 Screw on the hook bearing bracket so that numbers 438 and 439 can be read from the front. (See circle in Fig. 18.)
 - 15.8 Turn or move the hook bearing bracket in such a way that the hook shaft contacts both the vertical and horizontal surfaces of the gauge.
 - 15.9 In this position, firmly tighten allen screw 39 of the taper key and remove the gauge.

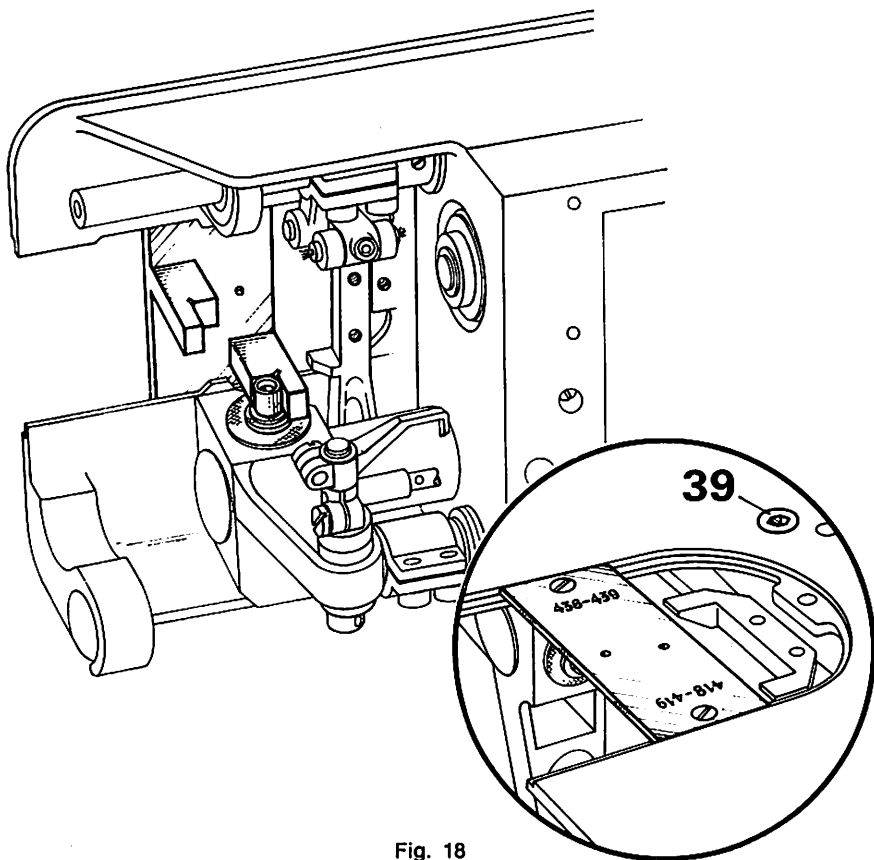


Fig. 18

16. Adjusting the Sewing Hook

- 16.1 Place the sewing hook without bobbin case on the hook shaft in such a way that its point is at the top.
- 16.2 Hold the sewing hook steady while rotating the balance wheel until the needle bar has passed its lowest point and has risen 2.0 mm (abt. $\frac{5}{64}$ ").
- 16.3 Insert the cylindrical pin in hole 1 of the bearing plate so that the machine is blocked in this position (needle rise position).
- 16.4 Make sure the needle position lever is still in its central position and the stitch width lever points to "0".
- 16.5 Tighten one of the hook set screws just sufficiently to allow the sewing hook to be turned on its shaft against strong resistance.
- 16.6 Turn or move the sewing hook until there is a clearance of about 0.1 mm (.004") between the hook point and the needle. Make sure that the point of the sewing hook is positioned exactly behind the needle.
- 16.7 In this position, tighten both hook set screws firmly.
- 16.8 Remove the cylindrical pin from the hole of the bearing plate.
- 16.9 Screw on the bobbin case position finger so that it is positioned in the slot of the bobbin case base and that there is a clearance of about 0.5 mm (.02") between its front edge and the bobbin case base.

17. Setting the Needle Bar at the Correct Height (Fig. 19)

- 17.1 Flick the stitch width lever to "0" and the needle position lever to its left position.
- 17.2 Rotate the balance until the hook point is positioned exactly behind the needle.
- 17.3 Loosen both clamp screws **40** on the needle bar connecting stud.
- 17.4 Push the needle bar up or down until the hook point is positioned 0.5 mm (.02") above the top of the needle eye (see circle in Fig. 19).
- 17.5 In this position, tighten both clamp screws **40** securely, making sure that the thread guide of the needle holder points forward.

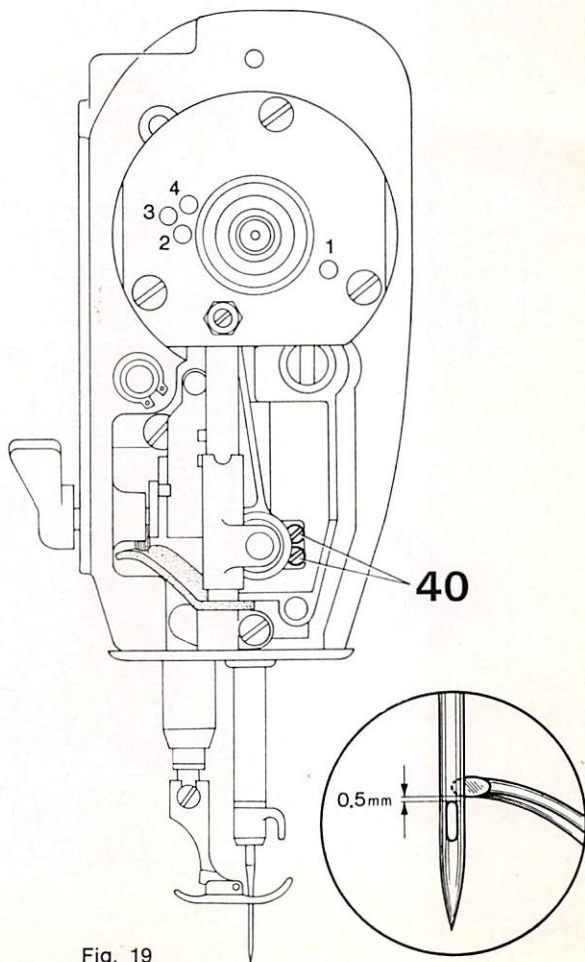


Fig. 19

18. Tensioning the Driving Belt in the Gear Case (Fig. 20)

- 18.1** Loosen screw 41 of the eccentric bushing in the gear case.
- 18.2** Move the eccentric bushing endwise until the driving belt is positioned in the middle of the sprocket driving the bobbin case opener eccentric.
- 18.3** Rotate the eccentric bushing without moving it endwise until the belt is sufficiently taut, but be careful not to tension it too much as this would cause hard running.
- 18.4** In this position, tighten screw 41 of the eccentric bushing securely.

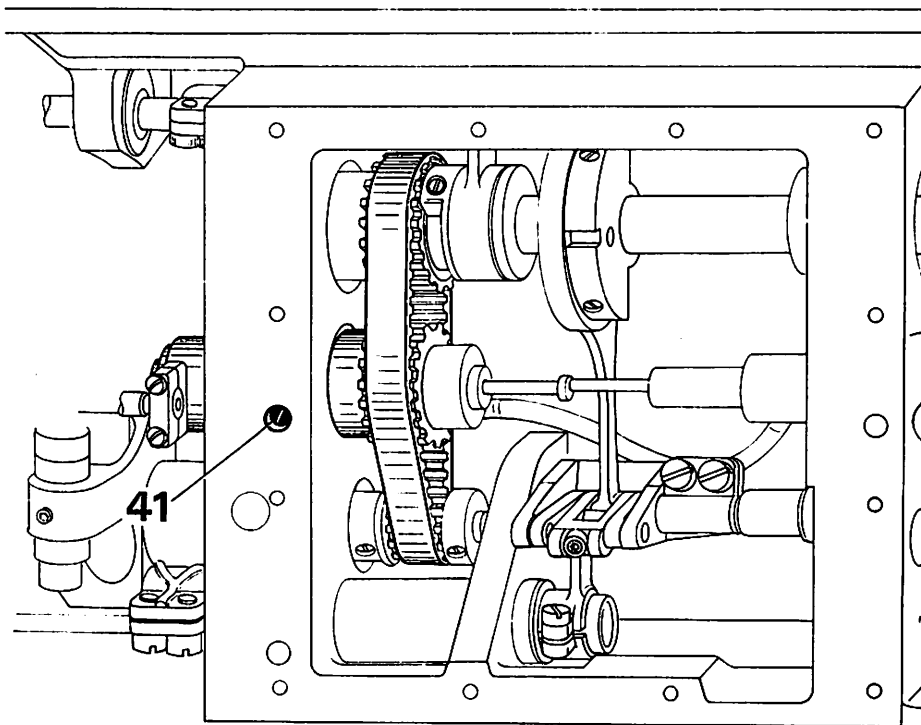


Fig. 20

19. **Adjusting the Bobbin Case Opener (Fig. 21)**
- 19.1 Loosen allen screw 42 of the eccentric bearing bushing of the bobbin case opener shaft which is located in the hook bearing bracket.
- 19.2 Push the bobbin case opener, which is still swung out, against the clamp crank underneath. Then push up the eccentric bushing while swinging the bobbin case opener finger towards the right until it contacts the lug of the bobbin case base.
- 19.3 Turn the eccentric bushing in such a way that the top edge of opener finger is in line with the inner side of the bobbin case base (see middle circle of Fig. 21).
- 19.4 In this position, push the eccentric bushing endwise until there is a clearance of 0.8 mm (.03") between the bottom edge of the opener finger and the rim of the bobbin case (see lower circle of Fig. 21).
- 19.5 In this position, tighten allen screw 42 of the eccentric bushing firmly.
- 19.6 Turn the balance wheel until the bobbin case opener finger is at the extreme left of its stroke.
- 19.7 Now turn the opener finger together with the bobbin case base towards the right until there is a clearance of abt. 0.3 mm (.01") between the bobbin case position finger and the right wall of the position slot in the bobbin case base (see upper circle of Fig. 21).
- 19.8 In this position, tighten clamp screw 43 of the bobbin case opener firmly, making sure that the bobbin case opener is up against the clamp crank underneath.

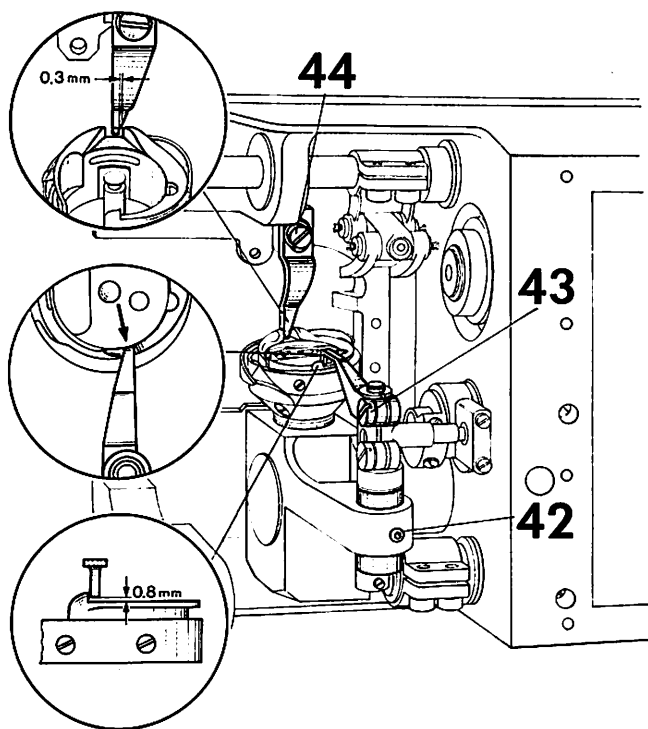


Fig. 21

20. Adjusting the Bobbin Case Opener Eccentric (Fig. 22)

- 20.1 Loosen the three screws **45** of the bobbin case opener eccentric.
- 20.2 Turn the screw in the middle in just sufficiently to allow the eccentric to be turned on its shaft against strong resistance.
- 20.3 Turn the balance wheel until the needle bar has passed its lowest point and risen 2 mm (abt. $\frac{5}{64}$ ").
- 20.4 Insert the cylindrical pin in hole **1** of the bearing plate to block the machine in this position.
- 20.5 Now turn the eccentric on its shaft until the bobbin case opener finger is at the extreme right of its stroke.
- 20.6 Remove the cylindrical pin from the bearing plate.
- 20.7 Tighten the three screws **45** of the bobbin case opener eccentric, beginning with the screw in the middle

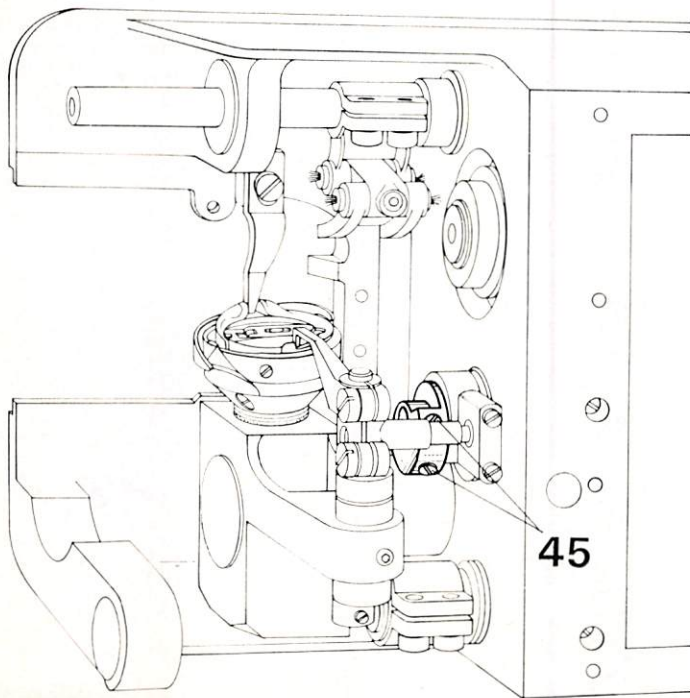
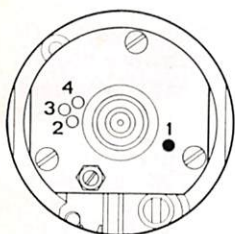


Fig. 22

21. Adjusting the Oil Check Valve (Fig. 23)

- 21.1 Loosen oil check valve screw **46**.
- 21.2 Push the actuating plunger of the centrifugal governor to the left as far as it will go.
- 21.3 Adjust the position of the oil check valve until there is a clearance of 1.0 mm (.04") between the valve rod and the actuating plunger.
- 21.4 In this position, tighten oil check valve screw **46** securely.
- 21.5 Replace the foam-plastic pad in the gear case and position it so that the cast iron fin enters the smallest cutout in the pad.
- 21.6 Clean the gear case gasket and screw on the gear case cover. Tighten the screws evenly crosswise.

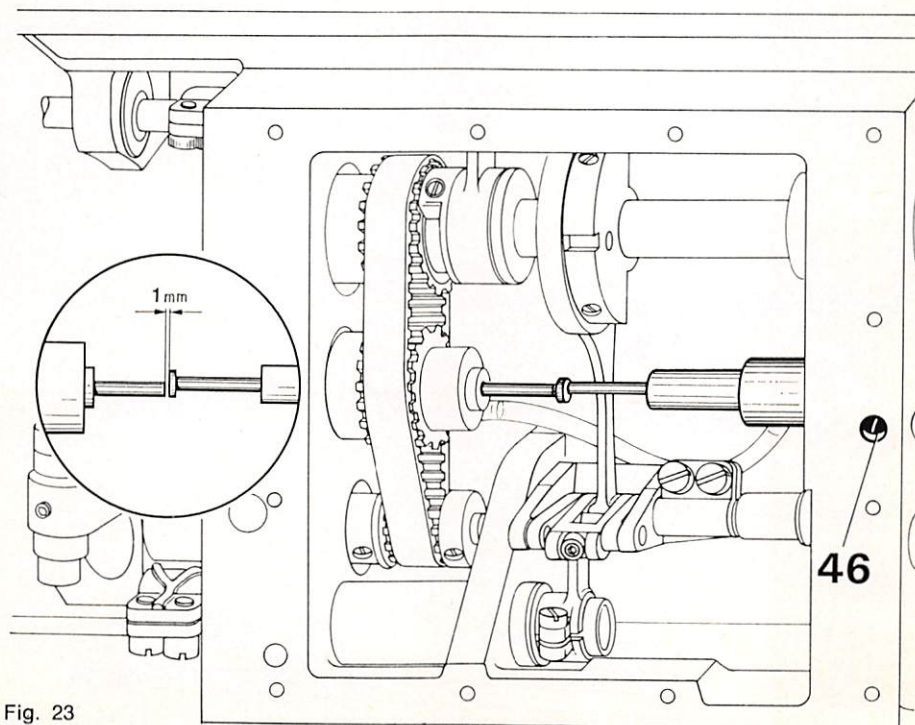


Fig. 23

22. Inserting the Oil Tube in the Oil Retainer Ring (Fig. 24)

22.1 Loosen allen screw **47** on the bedplate.

22.2 Insert the small bent copper tube in the hole of the oil retainer ring (see arrow in Fig. 24).

22.3 Tighten allen screw **47** securely.

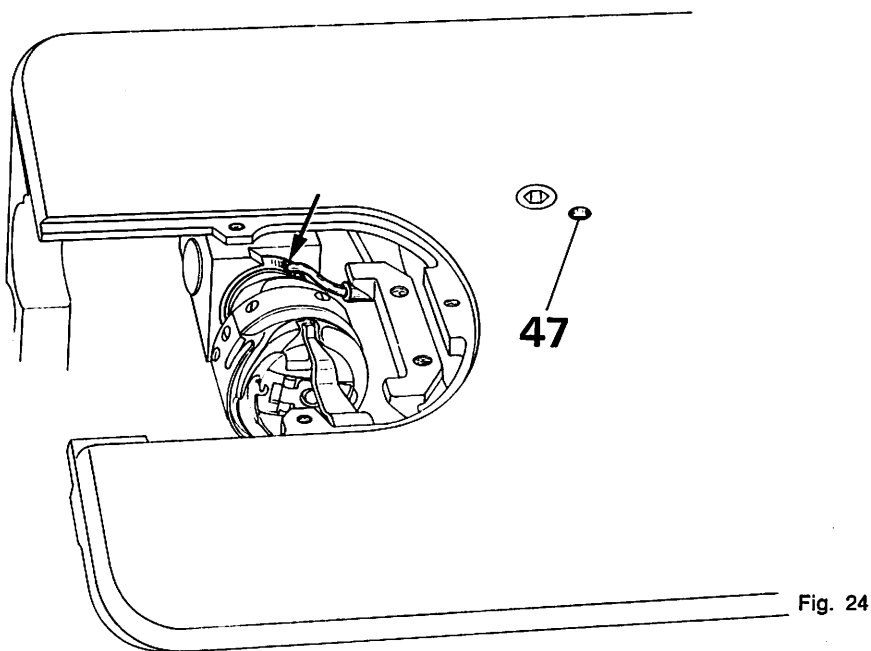


Fig. 24

23. Adjusting the Slack Thread Control (Fig. 25)

- 23.1 Flick the needle position lever to its central position and turn the stitch width lever to "0".
- 23.2 Bring the needle bar to its lowest point.
- 23.3 Loosen screw **8** of the slack thread control.
- 23.4 Adjust the position of the slack thread control on the presser bar bushing so that the lower edge of the slack thread control wire is in line with the top edge of the hole in the thread guide (see circle in Fig. 25).
- 23.5 In this position, tighten screw **8** of the slack thread control, making sure that the needle bar is opposite the center of the slack thread control wire.

Special sewing operations may make it necessary however, to set the slack thread control higher or lower.

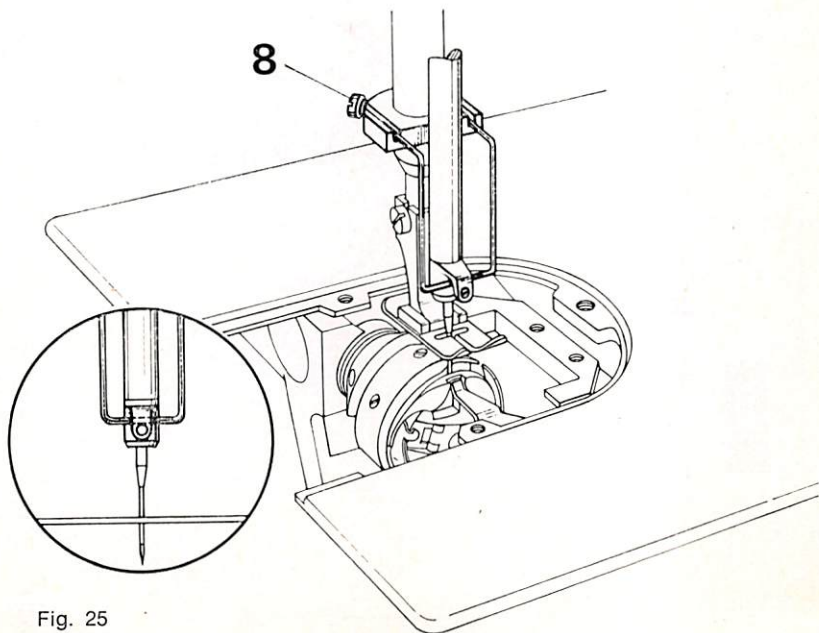


Fig. 25

24. Adjusting the Tension Release (Fig. 26)

(This adjustment does **not** apply to machines equipped with subcl. .900 thread trimmer)

- 24.1 Take out the four screws in the arm rear cover and swing the rear cover away towards the right.
- 24.2 Replace the needle plate without screwing it down, however.
- 24.3 Lower the presser bar lifter.
- 24.4 Loosen clamp screw **48** on the connecting rod crank which is accessible through the left aperture in the machine arm. If the connecting rod is not pulled down by spring action, push it down as far as it will go.
- 24.5 Operate the presser bar lifter to raise the presser foot.
- 24.6 Place the feed dog gauge under the presser foot with its recess up.
- 24.7 Lower the presser bar lifter to let the presser foot down into the recess of the gauge.
- 24.8 Loosen screw **49** on the tension release cam.
- 24.9 Move the cam on its shaft until it is exactly opposite the tension release plunger.
- 24.10 Turn the presser bar lifter upwards until a noticeable resistance is felt.
- 24.11 Turn the tension release cam until it contacts the tension release plunger and tighten screw **49** securely.
- 24.12 Remove the feed dog gauge from under the presser foot.
- 24.13 Swing the presser bar lifter down to lower the presser foot onto the needle plate.
- 24.14 Tighten clamp screw **48** securely, making sure that the circlip on the tension release shaft contacts the face side of the machine casting, and that the connecting rod crank is likewise up against the casting. (With the presser bar lifter raised to its highest point, the tension should now be released so that there is a clearance of about 0.5 mm (.02") between both tension discs.)

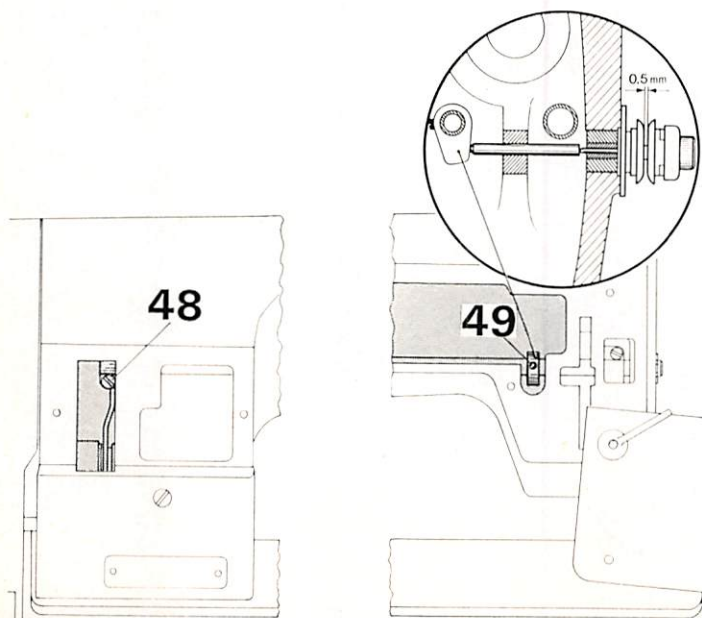


Fig. 26

25. Adjusting the Knee Lever (Fig. 27)

25.1 Limiting the Knee Lever Motion

- 25.1.1 Place the feed dog gauge under the presser foot with its recess down.
- 25.1.2 Operate the presser bar lifter to lower the presser foot onto the gauge.
- 25.1.3 Push the knee lever into its socket.
- 25.1.4 Loosen the jam nut on stop screw **51** which limits the knee lever motion.
- 25.1.5 Turn stop screw **51** out a few turns.
- 25.1.6 Push the knee lever sideways until a noticeable resistance is felt and hold it in this position. (Make sure the presser foot is not raised from the gauge in the process).
- 25.1.7 In this position, turn stop screw **51** in all the way and let the knee lever return to its normal position.
- 25.1.8 Turn the stop screw out one turn and tighten the jam nut.
- 25.1.9 Operate the knee lever now until it contacts the stop screw and remove the gauge from under the presser foot.
(The clearance between the presser foot and the needle plate has thus been limited to 8.0 mm (abt. $\frac{5}{16}$ ").

25.2 Adjusting the Knee Lever Play

- 25.2.1 Remove the needle plate.
- 25.2.2 Loosen both jam nuts **50** on the connecting link of the knee lever socket.
- 25.2.3 Turn the rear nut in until there is a noticeable play between the nut and the connecting link when you push the knee lever lightly.
- 25.2.4 Hold the rear nut steady with a wrench and tighten the front jam nut.
- 25.2.5 Pull the knee lever out of its socket again.

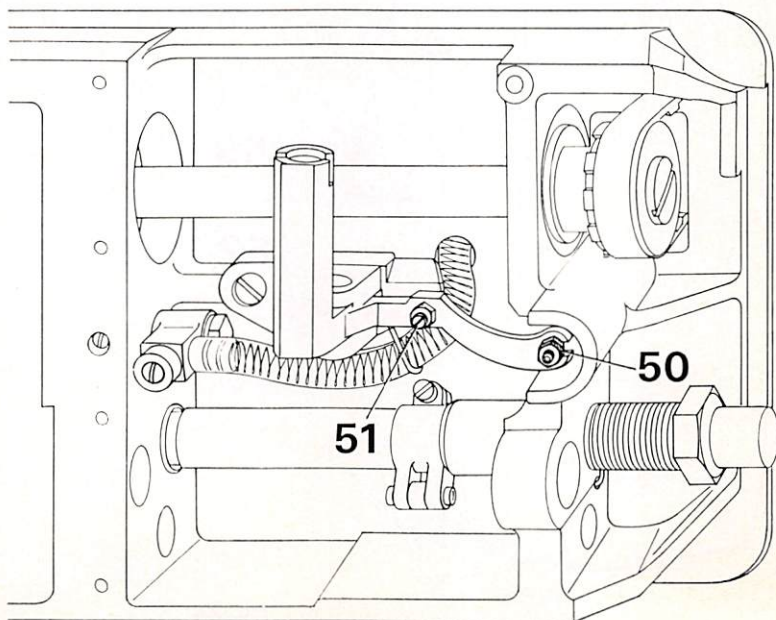


Fig. 27

26. Adjusting the Thread Check Spring and the Slack Thread Regulator (Fig. 28)

- 26.1 Loosen both screws **52** just sufficiently to enable the tension barrel with the thread check spring to be turned in the tension bracket.
- 26.2 Rotate the tension barrel until the stroke of the thread check spring measures about 7.0 mm ($\frac{9}{32}$ ").
- Special sewing operations may make it necessary to choose a longer or shorter stroke.
- 26.3 The tension of the thread check spring is regulated in the usual manner by turning the tension stud.
- 26.4 Loosen both screws **53** and push the slack thread regulator up as far as it will go.
- 26.5 In this position, tighten both screws **53** securely.

The setting of the slack thread regulator is chiefly dependent on the type of thread and material being used and has to be adjusted accordingly.

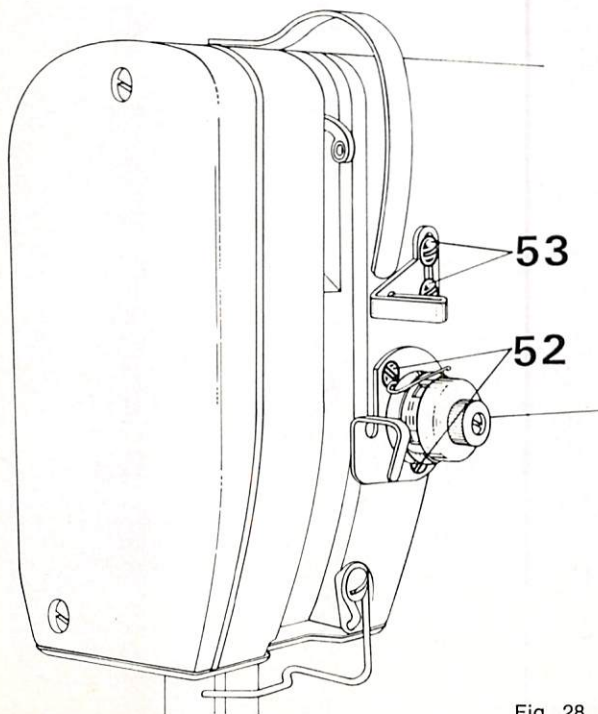


Fig. 28

27. Adjusting the Bobbin Winder Pulley (Fig. 29)

- 27.1 Engage the bobbin winder by pushing against its spindle.
- 27.2 Loosen both screws **54** (which can be reached through the aperture on the back of the machine arm).
- 27.3 Move the pulley on the arm shaft so that it will drive the bobbin winder spindle reliably when the bobbin winder is engaged. Make sure, however, that the pulley does not contact the friction wheel when the bobbin winder is disengaged.
- 27.4 Tighten both screws **54** in the pulley securely.
- 27.5 Swing the cover on the back of the machine arm back to its normal position and secure it in place with its four screws.
- 27.6 Loosen screw **55** of the regulating stud in the bobbin winder latch (see circle of Fig. 29).
- 27.7 Move the regulating stud to the right for less thread or to the left for more thread. Then tighten screw **55** firmly.

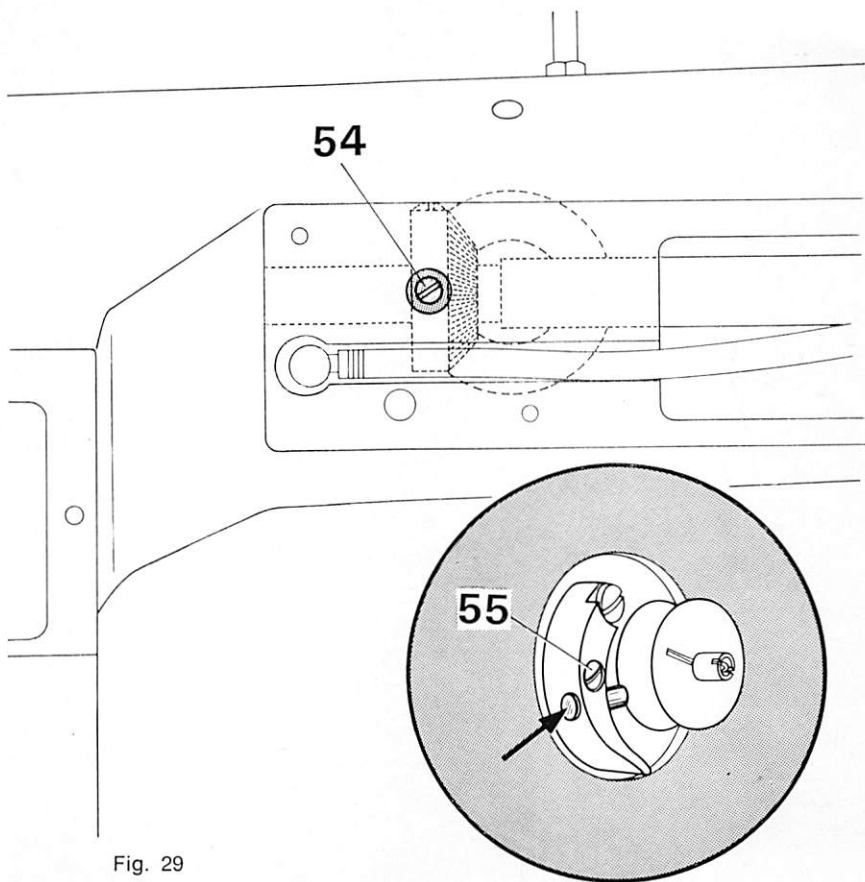


Fig. 29

28. Filling the Oil Reservoirs

- 28.1** Fill about 100 ccm (or 6 cu in) of Pfaff sewing machine oil No. 280-1-120 110 into the needle vibrating eccentric housing from the back of the machine.
- 28.2** Clean the contact surfaces of the cast-iron cover and screw it on with its two screws.
- 28.3** Fill Pfaff sewing machine oil No. 280-1-120 110 into the hook oil reservoir through a hole in the oil sight glass on the front of the machine arm until it reaches the top mark.

When replenishing the oil later, oil flows through an overflow duct from the hook oil reservoir into the needle vibrating eccentric housing. Top up the oil until the oil level has reached the top mark on the oil sight glass of the hook oil reservoir.

29. Regulating the Hook Lubrication (Fig. 30)

- 29.1 Turn oil regulating screw **56** in completely, then turn it out half a turn again.
- 29.2 Turn on the master switch and let the machine run for about one minute.
- 29.3 Remove the needle plate, place a piece of white paper over the needle plate cutout and hold it there.
- 29.4 Let the machine run for about ten seconds. Check to see if there is a thin line of spray oil opposite the hook raceway.
- 29.5 To regulate the flow of oil to the sewing hook, turn screw **56** in or out, as may be required.
- 29.6 Replace the feed dog and the needle plate as well as the face cover, the thread guide and the bed slide.

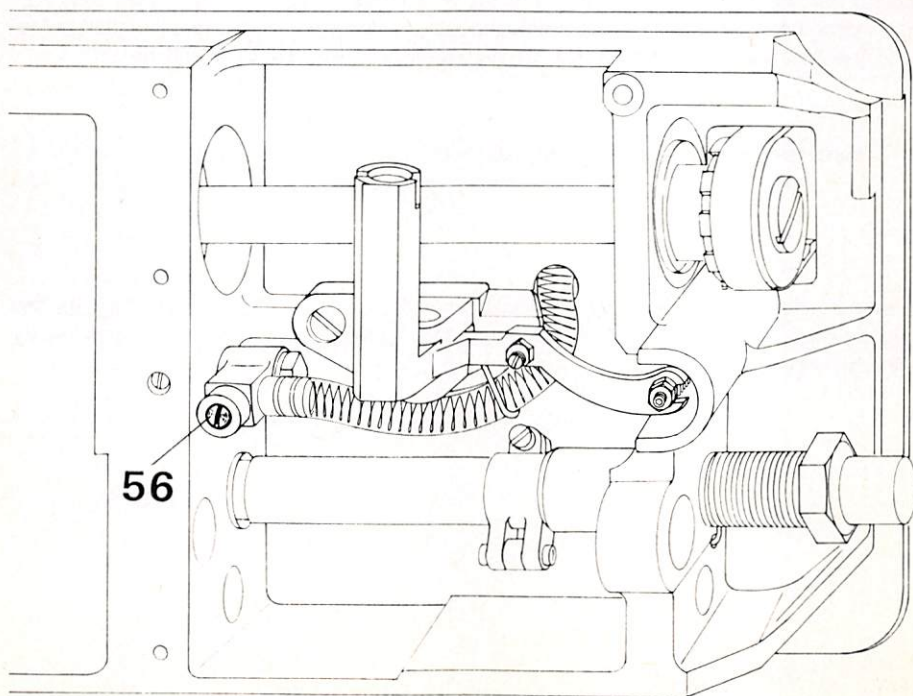


Fig. 30

Important Lubricating Pointers

When the Pfaff 438 is made ready for shipment, the oil is drained from the needle vibrating eccentric housing. It is absolutely necessary that you fill **100 ccm (6 cu in)** of **Pfaff sewing machine oil No. 280-1-120 110** into this housing before the machine is put into operation for the first time. (A sticker on the machine arm serves as a reminder).

Replenishing the oil in the hook oil reservoir can be done by the operator herself. All she has to do is stick the spout of the oil can into the hole in the hook oil reservoir and top up the oil until the oil level has reached the top mark on the oil sight glass.

The gear case underneath the bedplate contains about **130 ccm (8 cu in)** of **Pfaff sewing machine oil No. 280-1-120 108** which has to be changed only when the gear case has been opened for performing certain adjustments. In this case, it is recommended to replace the **two foam-plastic pads No. 91-168 393-05 and No. 91-168 394-05** also.

Important note: Use only oil No. 280-1-120 108 in the gear case.

When the machine is overhauled thoroughly, put **2 ccm (abt. 1/8 cu in)** of **Molykote 350** pinion grease in the hook bevel gear case. This grease may be obtained from us by **Order No. 280-1-120 199**.

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