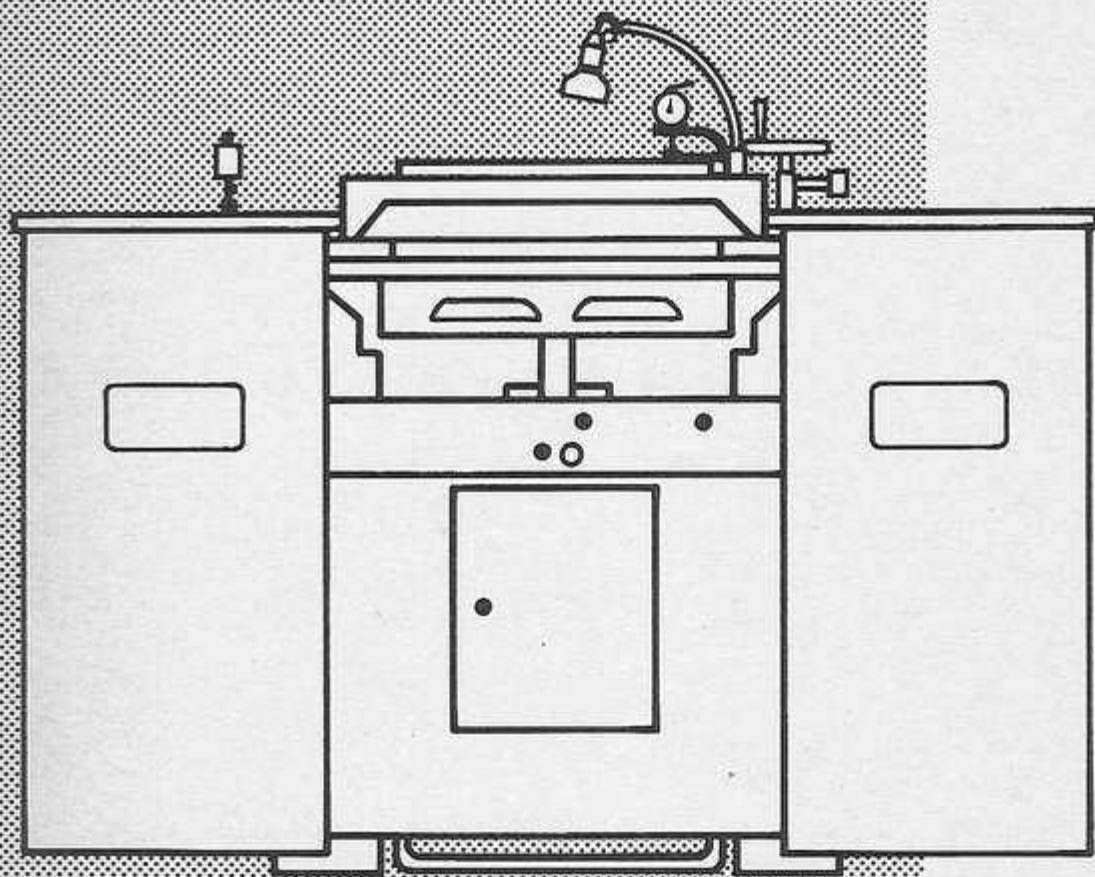


# NAF 470



**FORTUNA - WERKE**  
**MASCHINENFABRIK AG**  
**STUTTGART - BAD CANNSTATT**

Operating Instructions

# Bandknife-Splitting Machine

## Type NAF 470 valid as from machine No. 2000

PLEASE READ THESE INSTRUCTIONS BEFORE  
transporting, connecting, and operating the machine

For better understanding, each part described has got  
a number in accordance with the respective illustration

Please do not use these numbers when ordering,  
but the indications engraved on each part, or  
the numbers given in our list of spare parts.

This instruction manual applies to machine No.

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1086 4.79 e

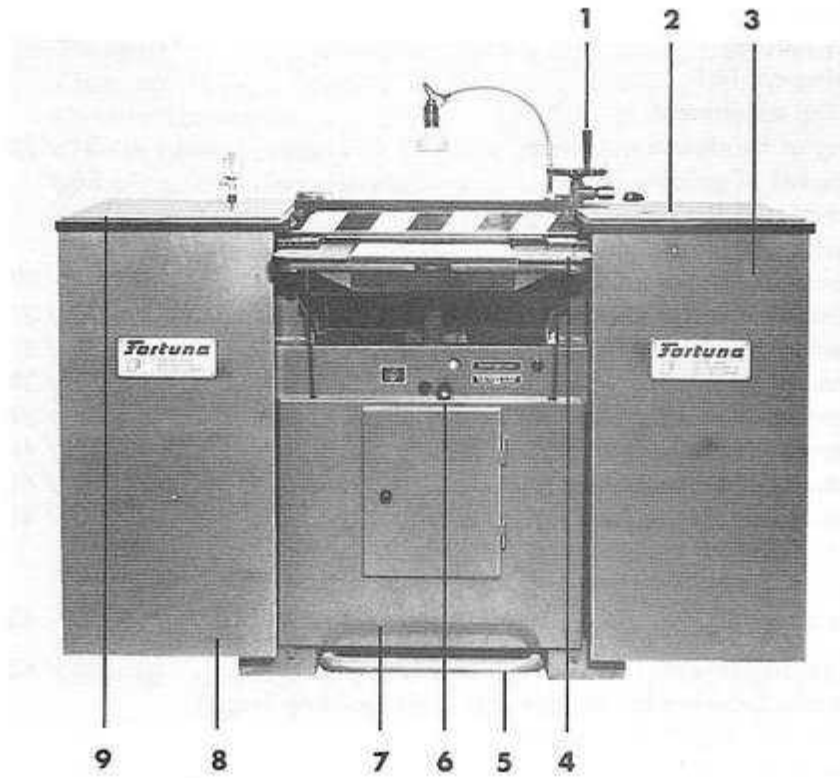
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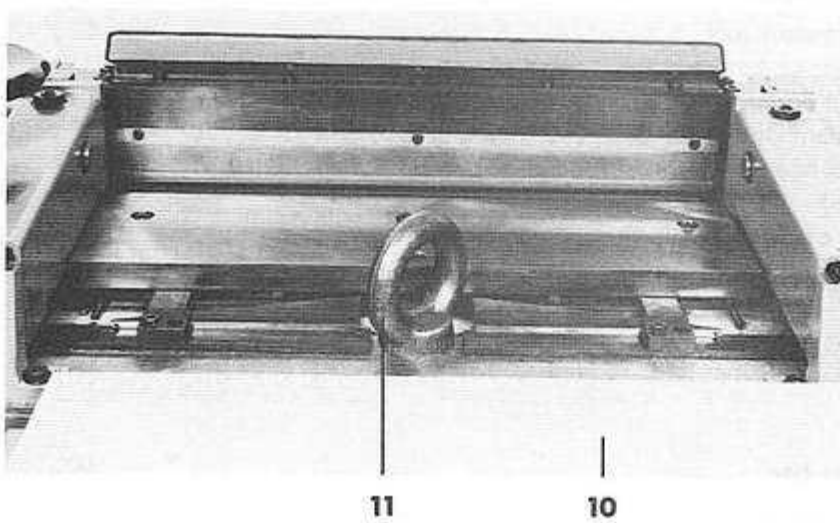
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①



②



## 1. Preparatory Work

### 1.1 Unpacking

Some of the tools and accessories are packed in the scrap box (in rear of machine stand). Please, unpack these first. To open scrap box, release fasteners and pull out scrap box.

Please, unpack parts carefully!

Check whether machine and accessories are complete and in good condition (compare with delivery note and packing list).

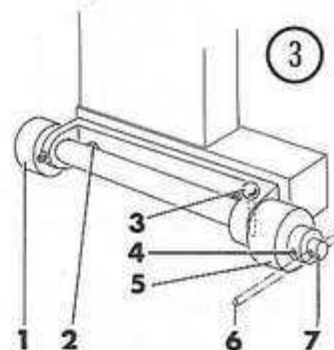
- ① Lift and remove both stacking plates 2 and 9, and front cover 7. Lift and remove lateral covers 3 and 8. Unscrew infeed table 4 (resp. roller- or illuminated table).

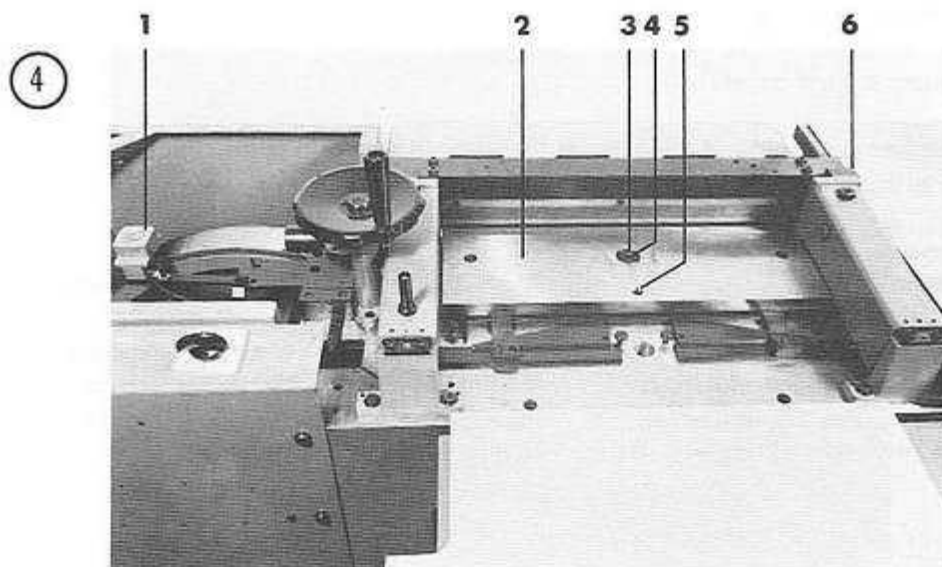
To dismantle the illuminated table, lift presser roll to upper position by means of handwheel 1. Put elastic feed roll into lower position by pressing down pedal 5; tighten knurled screw 6. Take out plug from illuminated table, loosen the two knurled screws, lift the illuminated table and remove it.

### 1.2 Transport

If, for transport by crane, a ring bolt has been ordered, you will find this inside the scrap box (see 1.1). To hang the machine on the crane, lift the rear covering plate 10 and pull it out. Screw ring bolt 11 into the threaded hole. On this bolt the machine can be lifted by the crane. After setting down the machine, remove ring bolt.

- ③ For transport without crane please use the two transporting devices 655-T 1 and lever 655-81 which have to be specially ordered. On both of the transporting devices loosen the screws 4, take off adjusting rings 5, loosen cylindrical screws 1, and remove pins 3. Then pull out eccentric shafts and rollers and screw the bearing blocks onto the bottom right and left of the machine base with two screws 2 each. Pull the transporting devices back together and lift the machine on the rollers by turning the eccentric shaft 7 with lever 6. Lock the shaft with pin 3. The machine may now be moved to its place of location. Pull out the locking pin, turn the eccentric shaft, set the machine on the floor and take off the transport devices.





### 1.3 Cleaning

- ④ Swing out both lens holders 1 laterally.  
 Remove knife guide plate 2 by loosening the screw 3 with a hexagonal spanner. Make sure not to shift the slotted annular nut 4, nor the screw for the middle pressure spring 5. Take care that the two pressure springs do not jump off when the knife guide plate is removed. The whole surface of the machine body and all parts which are grease coated have to be cleaned with a piece of rag or with cotton waste. If packed for sea-shipment, remove brown anticorrosive coating from machined parts with benzine. Grease film on knife drum surfaces must be carefully removed with benzine before bandknife is put into operation in order to ensure its perfect running. Be careful not to let the solvent penetrate into the needle bearings of feed roll and presser roll.  
 The spacing parts 6 must neither be loosened nor removed, otherwise the machine will have to be readjusted.

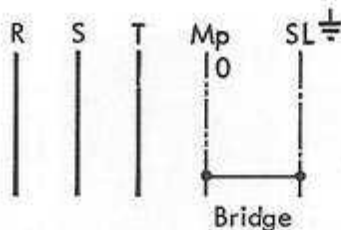
### 1.4 Electric Connection

Mains supply voltage (V) and frequency (Hz = cycles) have to be in accordance with the specification on motor name plates and with those on the label attached to the machine. The motors have been wired by the manufacturer according to buyer's specification and can be operated on this voltage only.

Input approximately 3 kW. Please check whether the circuit is properly protected by fuses. A connecting diagram has been attached to this instruction manual.

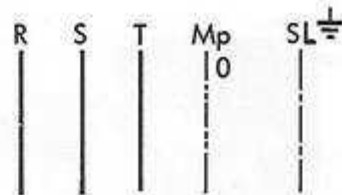
Connection of the machine through supply line cable has to be in accordance with the regulations of your power station:

a) with neutral feeder



between neutral wire and earth connection

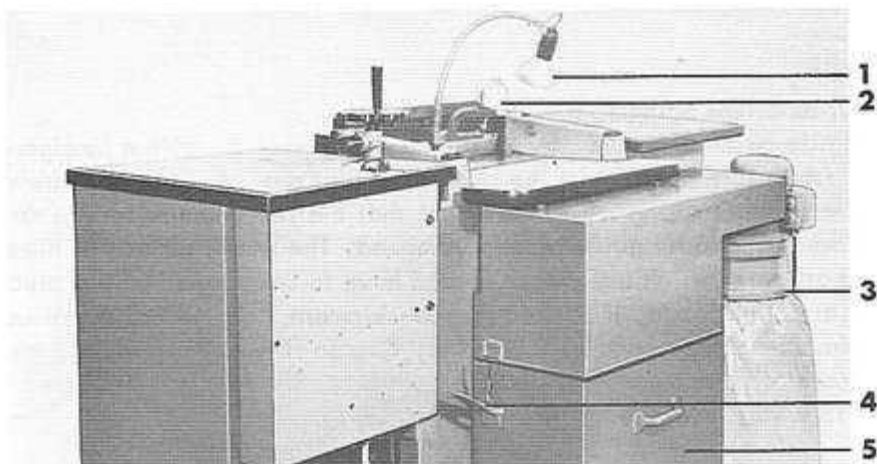
b) with earth wire protection



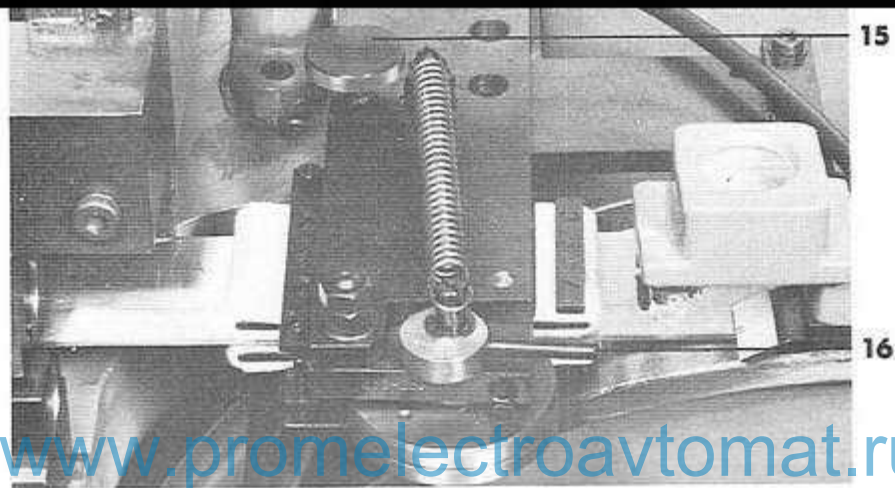
neutral wire and earth wire have to be connected separately.

Plug socket of your power supply has to be perfectly earthed so that machine and motors are also earthed after connection.



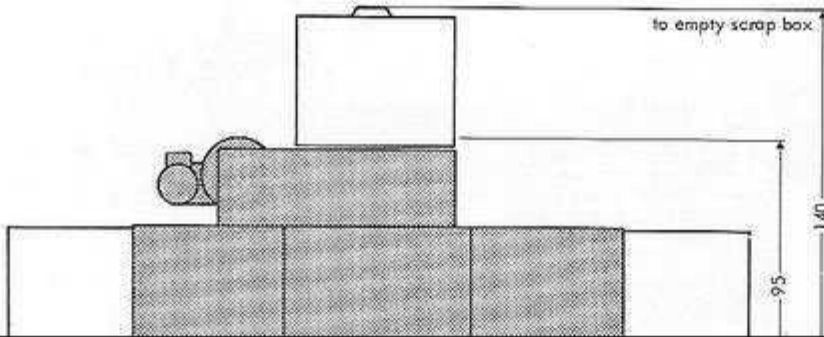


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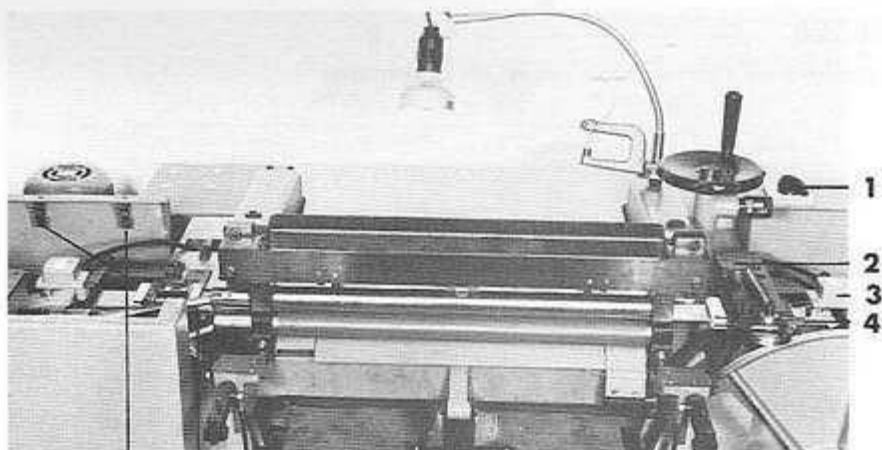
## 1.5 Setting-up

Space required by the machine ready for operation:



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- 8 By turning the eccentric disk 16 towards the front, let out the two supporting rolls for the bandknife (upper right and lower left) and turn them up by means of knurled screws 15.



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- 9 Pull the upper articulated shaft 7 out of the sleeve at the feed gear box and place the shaft on support 8 at the left-hand lateral cover.

Place V-belt of bandknife drive.

Start all motors for a moment by turning switch 1 to position "1".

Check whether the sense of rotation of the knife motor corresponds with the arrow marked on the right knife drum. If not, exchange two phases in the plug.

Earth  $\perp$  connection is always the yellow-green wire.

Install knife guide plate 2 (photo 4) with the two pressure springs: It should be tiltable without any difficulty on the ball disk.

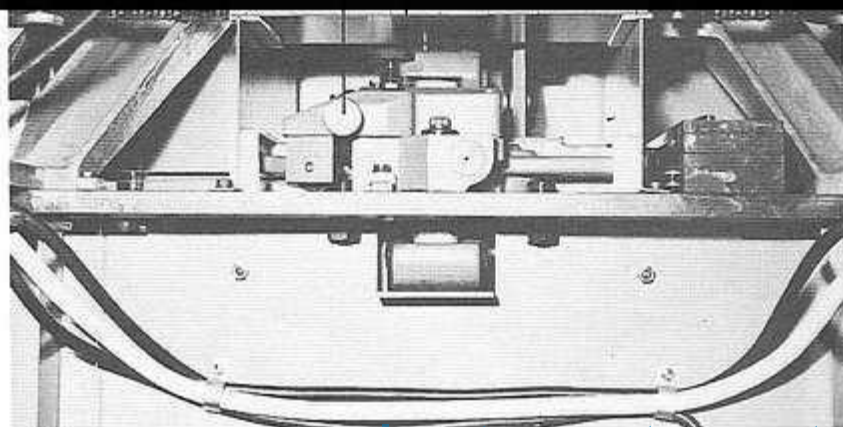
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the suction box. If the scrap box is not hooked in, the machine must not be used for splitting, since there will be no scrap removal.

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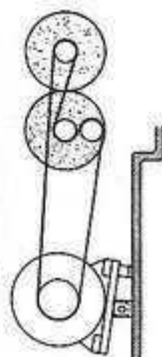


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Now take the flat belt for the grinding device out of the tool box and put it on according to drawing at right. Put the front cover in its place.

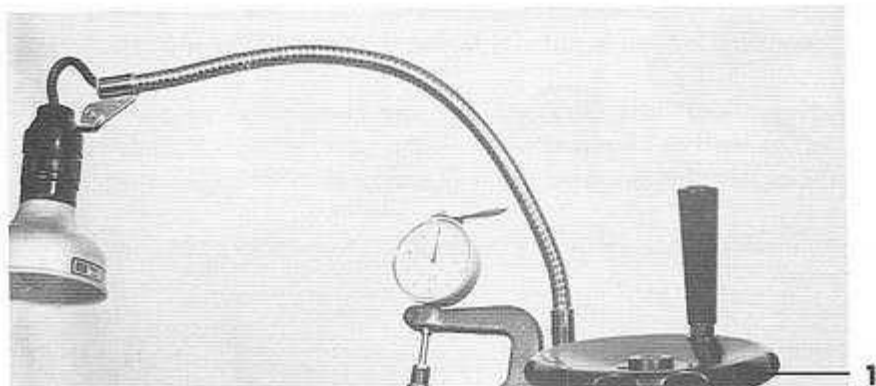
Insert articulated shaft into feed gear box and fasten stacking plates at right and left as well as covering plate in the rear. Attach infeed table, resp. roller- or illuminated table until it locks, then fasten knurled screws.

If using illuminated table, connect the plug with the socket at the table.

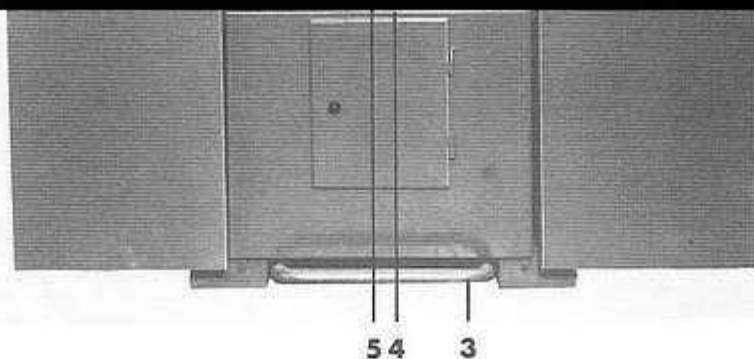


## 2. Adjustment before splitting

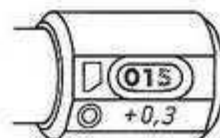
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## 2.4 Setting the Thickness of Split



- 14 Adjustment of the desired thickness of split is obtained on hand-wheel 1. The white numbers of the split thickness indicator 2 represent full millimeters, the red numbers are for tenths of millimeters.

Example:

These figures apply for the presser bar.



0 1 5

= 1,5 mm (.06")

For presser roll, add. 0,3 mm to the figure shown.

Example:



0 1 5

= 1,8 mm (.07")

These values depend on the material to be split, and on the tension of the short

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Pattern skiving: see pages 50/51.



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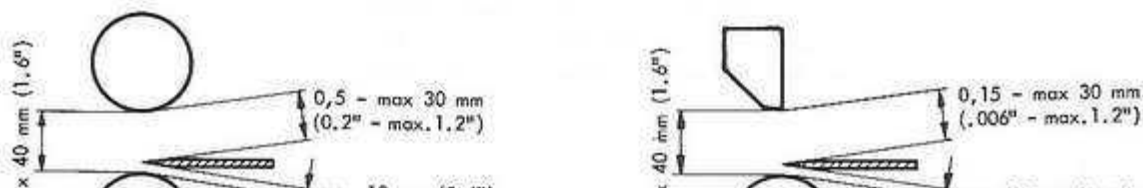
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## 2.7 Presser roll - Presser bar

The change from presser roll to presser bar is facilitated by a so-called reversing bracket.

### a) Application



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the supports 6 in the rear of left-hand lateral cover. Screw out both screws 3, remove reversing bracket 4, turn it upside down and re-install it with the roll turned upwards. Screw in and tighten the screws 3. The machine is now ready for splitting with the presser bar.

Replacing see page 41 paragraphs 5.10 and 5.11

Setting see page 43 paragraphs 6.4 and 6.5

## 2.8 Splitting

First choose presser roll or presser bar

Para. 2.7 Page 17

Switch machine on

Most materials can be split with the feeding speed "2".

If heavy or hard material is not passing through smoothly, or if the split is faulty, i.e. undulated or unequally thick, it is advisable to switch over to the lower feeding speed "1".

Adjust grinding wheels so as to produce a low light grinding Disc 2.2 Page 22

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be used again in order to find the correct adjustment.

A workpiece which has been introduced by mistake, can thus be pulled back by pressing down the pedal (treadle).

### 3. Servicing

#### 3.1 Periodical Servicing

The bearings of our splitting machines are covered and packed with lubricant so that they do not require any servicing. The little maintenance work which is necessary should, however, be done in regular intervals to ensure trouble-free operation of the machine.

- a) Daily
- Clean the machine.
  - Clear the grinding device of grinding dust.
  - Empty the scrap box.
  - Clean the wire mesh and

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#### Lubricants:

BP	Energrease HT EP 0
CALTEX (TEXACO)	Marfak 00
SHELL	Special transmission grease H (Simnia Grease 012)
VEEDOL	Atworth B

Exchange the lubricant of the feed gear:  
 Dismantle gear box, remove four screws and cover. Wash out all remaining grease and put in 0,2 kg of grease SHELL Retinax G after careful cleaning.

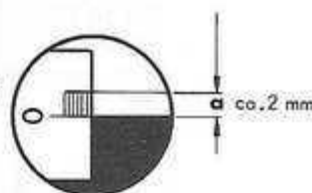
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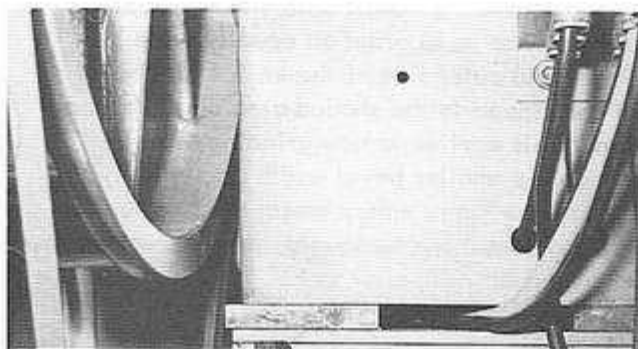
### 3.2 Bandknife Resharpening

- 18 If the bandknife is blunt and does not cut so well any more, reset the two knurled screws 3 until both emery wheels produce sparks uniformly so as to grind an equally wide bevel edge at the inner and outer side of the knife. The bevel width  $a$  has to correspond to the shaded area on scale under the magnifying lens. This applies to new grinding wheels only. Used wheels give a smaller bevel width accordingly. If the bevel is too wide, the upper emery wheel must be further advanced; if the bevel is not wide enough, the lower emery wheel must be advanced accordingly.



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### 3.5 Retensioning of Belts

- a) Feed drive                      Poly-V-belt    J 4x1473  
Remove l. h. stacking plate and l. h. lateral cover.  
Loosen screws of holding angle of motor at the lower  
machine part so that the motor slides downwards by  
its own weight, thus tensioning the belt.  
Retighten screws.
- b) Knife drive                     Narrow V-belt    12,5x2150 DIN 7753  
Remove r.h. stacking plate and r.h. lateral cover.  
Loosen four screws 2 at the motor base. Shift  
the motor by turning clamping screw 1, until the

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■ Early emptying of scrap box saves you additional work.

Remove scrap between guide plate and feed roll;  
switch the machine on again.

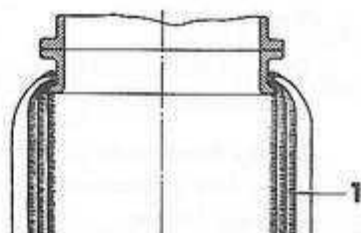


## b) Wire mesh

The wire mesh in the suction box prevents scrap pieces from penetrating into the blower. It is kept in the suction box by a spring-loaded catch and can be pulled downwards out of the suction box after removing the scrap box. For daily cleaning brush off the scrap or beat it off the wire.

## c) Dust filter

The dust-laden air is blown into the dust filter by the blower. Coarse dust is kept in the dust bag 1, the fine dust goes into the outer filter sack 2 so that only well-cleaned air is leaving the filter.



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## 4. Trouble Hunting

	CAUSE	REMEDY	see page, paragraph
4.1	<u>Bad Splitting Result</u>		
	Bandknife is blunt.	Resharpener the knife edge.	23 3.2 + 3.3
	Rack of lower knife back guide unclean.	Clean rack and drilled hole.	37 5.6
	Faulty bandknife guidance; knife has clearance between guiding ledges.	Readjust bandknife guidance.	37 5.4b

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tensioned.

the material.

Elastic feed roll does not sufficiently feed the material.

Use milled steel roll.

- -

### 4.3 Faulty Running of Bandknife

Bandknife is not sufficiently tensioned.

Retension bandknife.

35 5.2b

Bandknife is advanced too much or too little.

Readjust running of bandknife.

35 5.2d or

Bandknife is not running straight.

Reset bandknife.

43 6.1

CAUSE	REMEDY	see page, paragraph
<b>4.4 <u>Unsatisfactory Scrap Removal</u></b>		
Scrap box is full.	Empty scrap box.	25 3.6a
Suction system not tight: Scrap box not tightly fastened to the suction box.	Check whether fastener is tightly hooked in, push in the scrap box up to the stop and clamp it firmly.	10 photo (10)
Sealing rubber at suction box is	Insert a new sealing rubber	

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One of the motor overload switches disconnects.

One of the motors has been overloaded when running on two phases only; so the bimetal relay disconnects.

Bulbs of the lamp and magnifying lenses do not burn.

Search for the cause of short-circuit and eliminate it. Put the motor overload switch back in.

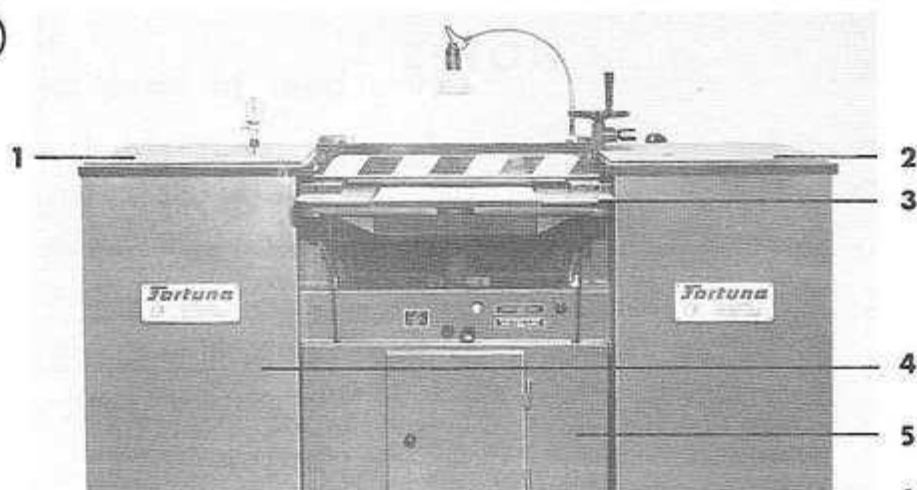
Check connections of the respective motor. If overload switch disconnects again when the motor is started, there must be a short-circuit in one of the coils of the motor.

Search for cause and eliminate it. Put in a new fuse: ES 12.12.1 (12 V on output side of transformer). Replace bulb, if necessary.

## 5. Replacement of used parts

5.1 Parts Subject to Wear	see page, paragraph	
<u>Bandknife</u> 655-27	33/35	5.2
<u>2 Bandknife guiding ledges</u> 655-1002	37	5.4
<u>Knife back guide</u> 655-102-1	37	5.5
<u>Knife back guide inside grinding device</u> 655-356	37	5.6
<u>Scraper- and lubricating felts</u>		
1 felt pad 655-58		
1 felt pad 655-58/1		
4 felt pads 655-59		

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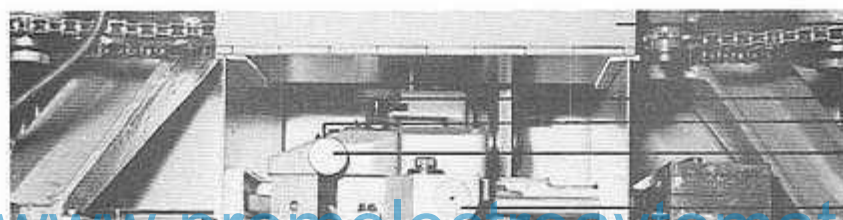
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655-123

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## 5.2 Replacement of Bandknife 655-27

### a) Removal of bandknife.

20

To remove bandknife, take off left and right stacking plates 1 and 2.

Pull out the front cover 5.

Release and remove the side covers 4 and 6.

Unscrew the feeding table, resp. the illuminated table 3.

Set apart the two emery wheels by clockwise turning the two spindles.

Dull the bandknife edge with a carborundum stone.

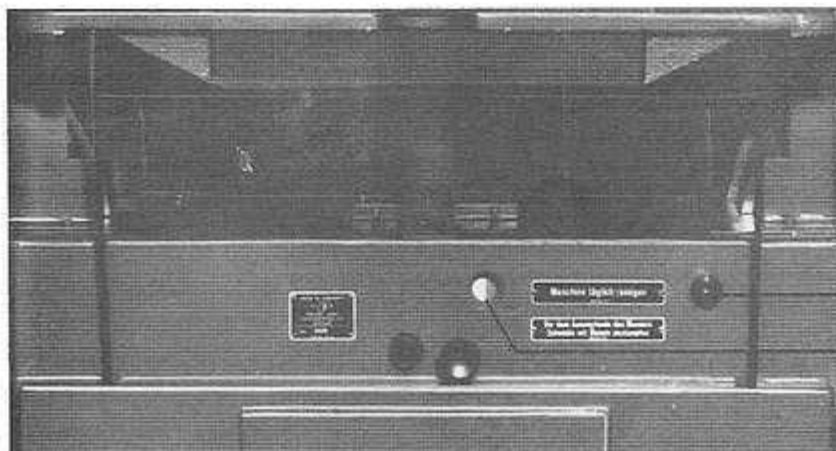
Remove the oiler- and scraper felts.

Release feed roll by pressing down pedal 7, fasten it by means of knurled screw 10.

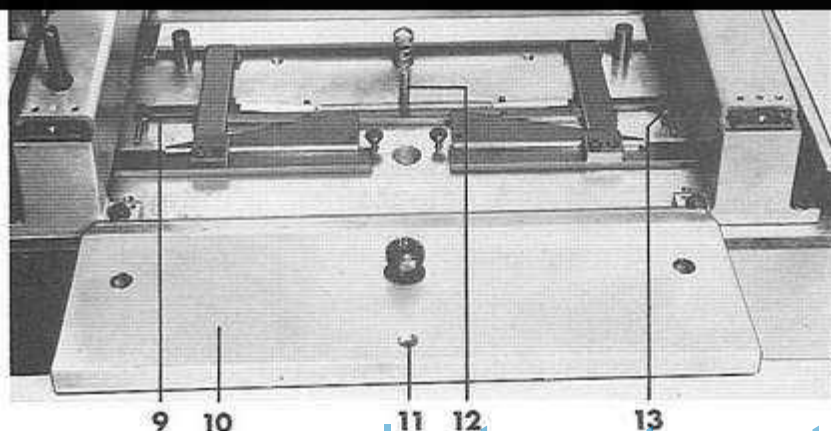
Take off V-belt from feed drive and flat belt from grinding device.

Unhook the traction bars of the pedal.

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## b) Placing of Bandknife.

Insert the oiler felt at the oil container at upper left side.

Put on a new bandknife and slide it completely into the knife guiding device.

24 Retension bandknife at 1 until the indicator plate 2 is half white and half red, and at the same time turn the r. h. knife drum by hand.

25 If the knife guide plate 3 has been removed for cleaning, it has to be tiltable on the ball disk without any difficulty, after reinstallation. Otherwise please check whether the two springs 4 and 5 are properly centered.

Install the remaining oiler- and scraper felts and put on some oil.

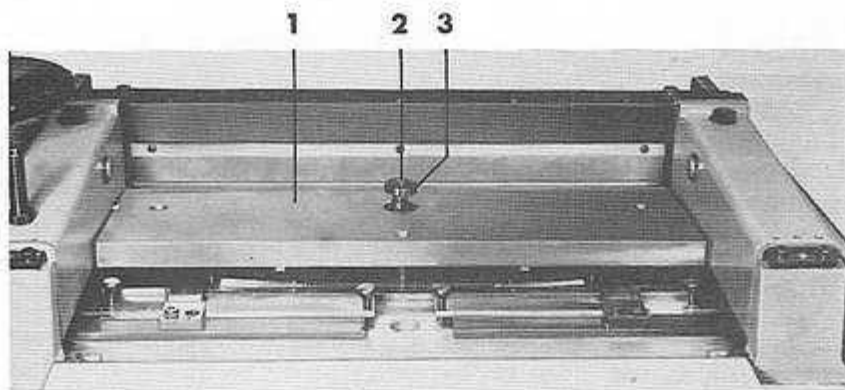
At upper and lower guide roll turn back the knurled screws until stop and bring the eccentric disks back into their starting position.

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such a way that the plate tilts forward. The threaded pin must at least be flush with the knife guide plate. Then release setting wedges. These wedges 9 automatically keep the knife guiding ledges in close contact with the knife, even if they are gradually wearing.



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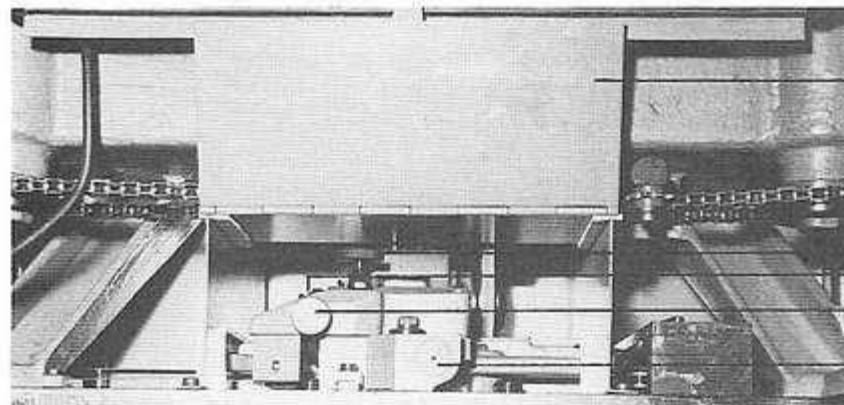


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#### 5.4 Replacement of Guiding Ledges 655-1002

##### a) Removal and fitting:

The guiding ledges have a special coating and must be replaced as soon as this coating is worn. Retouching of the ledges is not possible.

Remove the bandknife (see page 33, para. 5.2a).

28

Loosen the threaded pin 2 by means of hexagonal spanner 6 DIN 911.

Its position must not be altered with respect to the face hole nut 3. Take off knife guide plate 1 and make sure that the two pressure springs do not jump off. The correct and close knife guide position is based upon the adjustment of the ball disk - together with threaded pin and face hole nut - therefore, the position of these parts must not be changed; unless the knife guide plate has to be re-adjusted.

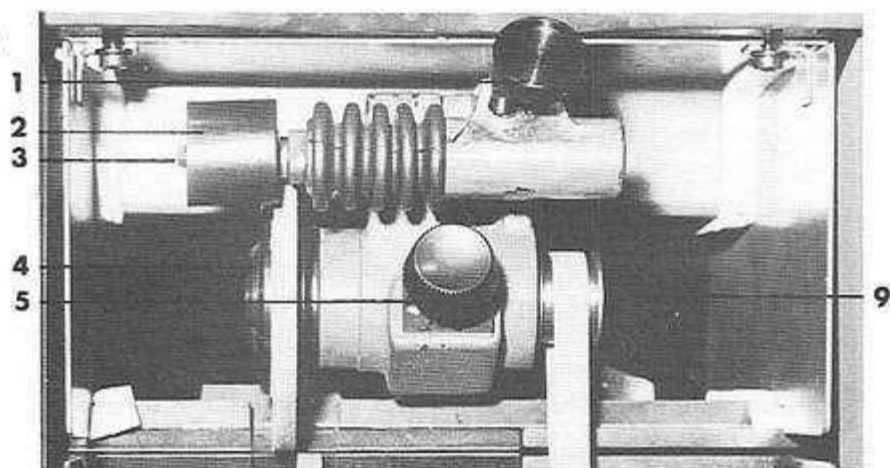


#### 5.6 Replacement of Lower Knife Back Guide 655-356

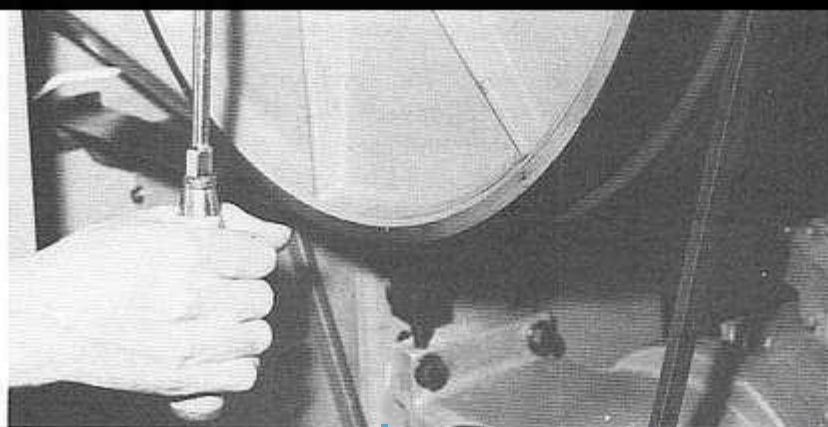
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Lift cover 14, loosen knurled screw 15, and turn the pulley 16 until the rack can be taken out, after removal of cover 18. Lock the pulley with knurled screw 17. Change the Resitex part at the rack. Thoroughly clean the bore hole and the rack, if necessary.

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## 5.7 Replacement of Emery Wheels 655-316

Both emery wheels have to be replaced together since equal knife bevels are only guaranteed by equal diameters.

Original FORTUNA emery wheels ensure perfect grinding and a sharp knife edge. The cardboard flanges prevent the wheels from cracking while they are tensioned. Remove front plate.

32

Bring upper and lower dressing device into initial position for dressing new emery wheels by clockwise turning the two locking screws 1 and the spindles 5. Hold the spindles 9 fast with pin spanner 6 DIN 911 applied at the r.h. end. Loosen the counter flange 4 of the upper wheel by r.h. turning and the lower counter flange 6 by l.h. turning.

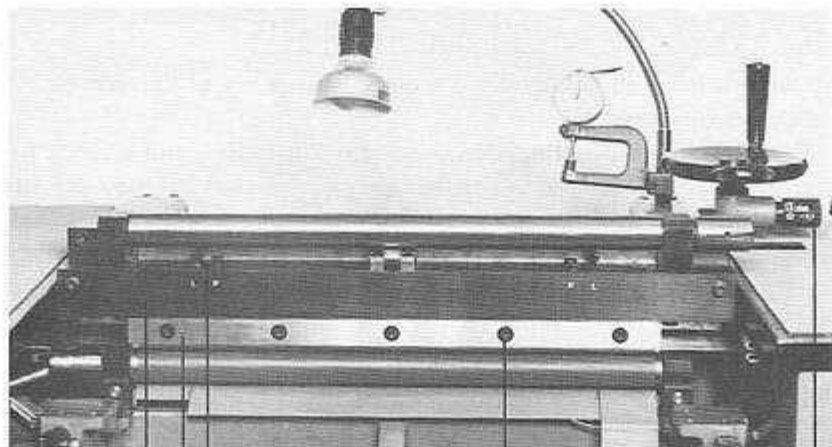
Replace the emery wheels and reinstall the parts in reverse order.

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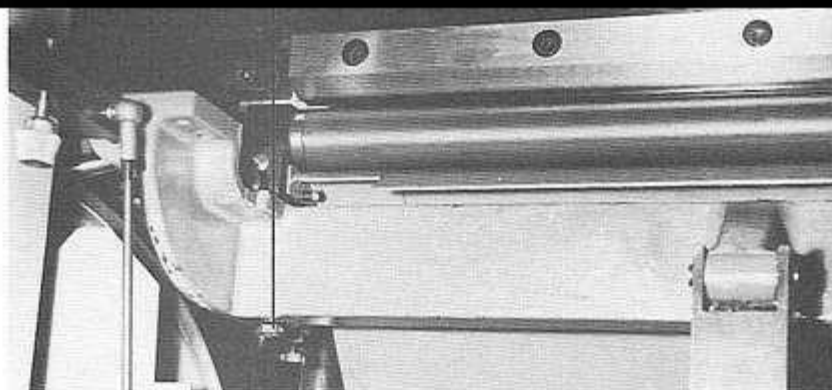
their actual position (so as to keep cup springs in place), and take off the V-belt.

Put in a new belt and reinstall parts in reverse order. Tension V-belt (see 3.5b, page 25).





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## 5.10 Replacement of Presser Bar

- 34 Loosen the five screws 4 and take off the presser bar 2.  
 Insert new presser bar and tension the five screws 4.  
 Lower the reversing bracket 1 until the thickness indicator 5 shows the position 0 1 0 .  
 Make one splitting test on either side; both tested parts have to be 1 mm thick.  
 If the setting is not correct, loosen screws 4.  
 Turn setting screw 3 L  
     to the right = presser bar is lowered (parts will be thinner)  
     to the left = presser bar is raised (parts will be thicker).  
 When setting screw is turned to the left, the presser bar has to be raised by hand.  
 Splitting tests on either side and adjustment of presser bar have to be repeated until

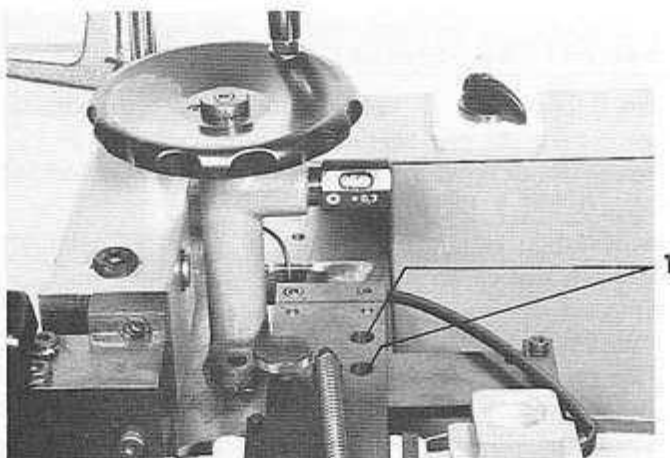
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## 6. Basic Setting

Exact measures can only be obtained by close setting of bandknife guidance and a sharp knife edge!

### 6.1 Bandknife Adjustment

Distance between knife edge and lower guiding ledge = 4,3 mm.

- 37 The bandknife is always protruding from the knife guidance by 4,3 mm, regardless of the material to be split, and regardless whether presser roll or bar are used, provided, however, it is running parallel and has normal advance motion. This is controlled with gauge 655-77/1 against the lower guiding ledge. If the position is not correct, turn grub screw 3 at the face of both supporting rolls. By clock-

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### 6.5 Adjustment of Presser Bar

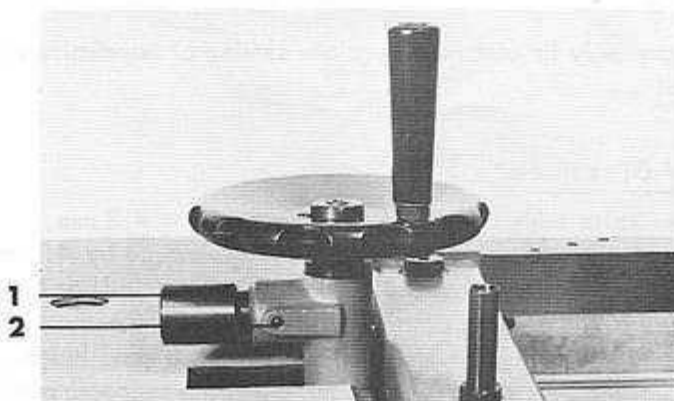
- 41 Distance between back edge of presser bar and knife edge: 0,2 mm.  
 Lower the presser bar until level of bandknife.  
 Control the distance between back edge of presser bar and knife edge, by means of a caliper gauge.

If the distance is not correct:

Loosen screws 7 and displace the angle 8 to which the presser bar is attached. Check the thickness adjustment by means of splitting tests and, if necessary, correct it according to 5.10.



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## 6.6 Setting of Thickness Indicator

Set the presser roll at a splitting clearance of about 1 mm.

Make a splitting test and measure the workpiece.

The workpiece must be by 0,3 mm thicker than the value shown at the thickness indicator.

- ④2 Otherwise loosen threaded pin 2, take out thickness indicator 1 and adjust it at 0,3 mm less than the value obtained by the splitting test.

## 6.7 Parallel adjustment of upper presser roll

- ④3 If chain 9 of the feed mechanism of the upper presser roll had to be removed during disassembly, check whether the presser roll is still placed parallel to the

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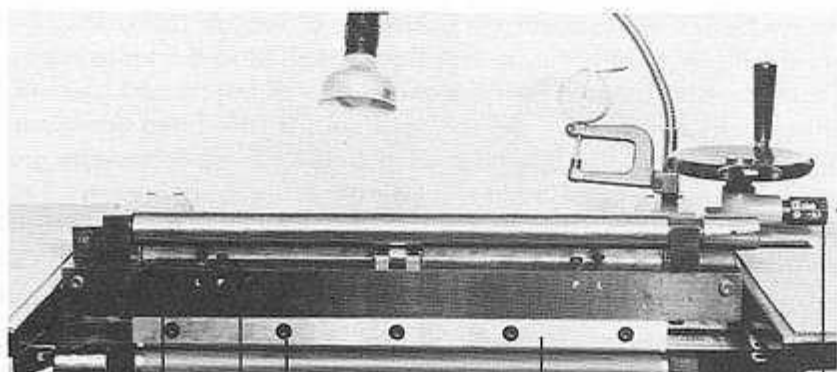
## 7. Special Liquid Device

Rubber and synthetics which smear the bandknife or impede its motion, can be split more conveniently by means of a special liquid applied to the knife edge. This special liquid can also be used for the manufacture of transparent patterns.

- 44 After opening locking cap 1, the special liquid is filled into container 2. Thanks to the dosage device 3, the special liquid can be dosed with greatest precision which can be controlled at sight glass 4 (one drop every 2-3 seconds). The special liquid passes through tube 5 which leads into a plastic distributor 6, and is then applied to the bandknife which runs in a slot of the plastic distributor. In case a white film is forming on the bandknife or on the knife drums, due to excessive liquid supply, this film can be removed by means of a wet cloth.

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## 8.2 Change from presser bar to profiling bar

Loosen the five screws 3 and remove presser bar.

Insert profiling bar 4 and tighten screws.

Lower reversing bracket 1 until the thickness indicator 5 shows the position **0 1 0**. Carry out one splitting test on either side without profile plates; both test pieces must have a thickness of 1 mm.

If this adjustment is not correct, proceed as follows:

Take off finger guard and loosen screws 3.

Turn setting screw 2 P

to the right = profiling bar is lowered (material will be thinner)

to the left = profiling bar is raised (material will be thicker).

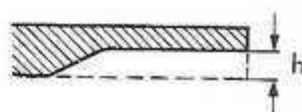
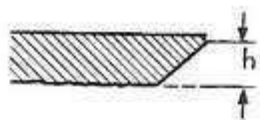
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### The Pattern Skiving Process

offers considerable saving of time, since uppers can be skived and, if necessary, levelled simultaneously. An unskilled worker will be able to do this work after only a short training period.

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- 2.2 The unfinished pattern is to be levelled on either side, using special liquid and roll, in order that the adhesive tape will stick to it. The thickness of the unfinished pattern should be approx. the max. scarf height ( $h$ ) of the master piece plus 0.8 mm.



- 2.3 Attach the master piece on the pattern material by means of adhesive tape 655-177 and mark its contours with a ball pen.
- 2.4 Measure the total thickness of pattern and master piece.  
From this thickness deduct 0.4 mm and adjust this value on the splitting machine UAF 470.
- 2.5 Now introduce both parts into the machine, with the elastic feed roll fully spring-loaded, readjusting the handwheel in order to obtain the desired thickness of split. Continue this procedure until the material outside the marked contours is slightly taken off. The thickness adjusted for the last passage has to be marked on the pattern as a standard gauge for later adjustments.
3. Pattern skiving (without special liquid, with full spring load)
  - 3.1 According to point 2.5, the thickness is adjusted in accordance with the standard gauge marked on the pattern.  
  
Depending on the material (hard or soft) of which the uppers consist, it may become necessary to correct the cutting edges of pattern or master piece, or to choose a different thickness adjustment.
  - 3.2 Due to the illuminated table and its smooth cover, the work piece can be easily positioned under the transparent pattern, since its contours have been marked on the pattern.
  - 3.3 Now pattern skiving begins: The parts are always to be introduced diagonally so that a long edge is never cut over its whole width. If, during the skiving process, pattern and work piece show a different stretch, which causes a shifting of the skiving cut from the front to the back part of the material, this can be corrected by placing the pattern on the workpiece in a dislocated way.



- |          |                               |         |  |          |                               |         |    |
|----------|-------------------------------|---------|--|----------|-------------------------------|---------|----|
| <b>A</b> | <b>Adjustment</b>             |         |  | <b>D</b> | <b>Dressing wheel sets</b>    |         |    |
|          | bandknife                     | 42 / 43 |  |          | replacement                   | 38 / 39 |    |
|          | bandknife advance running     | 34 / 35 |  |          | Dressing (emery wheels)       | 22 / 23 |    |
|          | bandknife guidance            | 36 / 37 |  |          | Dust filter                   |         | 27 |
|          | before splitting              | 12 - 17 |  | <b>E</b> | <b>Elastic feed roll,</b>     |         |    |
|          | magnifying lens               | 42 / 43 |  |          | see feed roll                 |         |    |
|          | presser bar / bandknife       | 42 / 43 |  |          | Electric connection           |         | 7  |
|          | presser roll / bandknife      | 42 / 43 |  |          | Electrical trouble            |         | 29 |
|          | profiling bar                 | 48 / 49 |  |          | Emery wheels                  |         |    |
|          | thickness indicator           | 44 / 45 |  |          | dressing                      | 22 / 23 |    |
|          | Application of presser roll / |         |  |          | replacement                   | 38 / 39 |    |
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| <b>B</b> | <b>Bandknife</b>              |         |  |          | Feed roll, lower              |         |    |
|          | adjustment                    | 42 / 43 |  |          | adjustment                    | 14 / 15 |    |
|          | adjustment of guidance        | 36 / 37 |  |          |                               | 42 / 43 |    |
|          | basic setting                 | 42 / 43 |  |          | basic setting                 | 42 / 43 |    |
|          | bevel width                   | 23      |  |          | replacement                   | 40 / 41 |    |
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|          | knifeback guidance,           |         |  | <b>G</b> | <b>Grinding dust</b>          |         | 27 |
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|          | replacement                   | 36 / 37 |  | <b>I</b> | <b>Illuminated table</b>      | 4 / 5   |    |
|          | tensioning                    | 10 / 11 |  | <b>K</b> | <b>Knife, see bandknife</b>   |         |    |
|          | parallel running              | 34 / 35 |  |          | Knife guide plate             | 7 + 35  |    |
|          | placing                       | 34 / 35 |  |          | Knife guiding ledge,          |         |    |
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|          | resharpening                  | 22 / 23 |  |          | with earth connection         | 7       |    |
|          | running, control of           | 23      |  |          | Line voltage                  | 7       |    |
|          | running faulty                | 28      |  |          | Lubrication                   | 21      |    |
|          | Bar, see presser bar          |         |  | <b>M</b> | <b>Machine stops running</b>  | 29      |    |
|          | Basic setting                 | 43 - 45 |  |          | Main switch                   | 12 / 13 |    |
|          | Belts, retensioning           | 24 / 25 |  |          | Mains frequency               | 7       |    |
|          | Bevel width of bandknife      | 23      |  | <b>O</b> | <b>Oiler felts</b>            | 11 + 21 |    |
| <b>C</b> | <b>Cleaning of machine</b>    | 6 / 7   |  | <b>P</b> | <b>Pattern skiving</b>        | 50 / 51 |    |
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|          | succession to be considered   |         |  |          | adjustment                    | 42 / 43 |    |
|          | as an indication how to       |         |  |          | application                   | 16 / 17 |    |
|          | operate the machine)          | 2 / 3   |  |          | change over to presser roll   | 16 / 17 |    |
|          | Control of sense of rotation  |         |  |          | replacement                   | 40 / 41 |    |
|          | of bandknife motor            | 11      |  |          |                               |         |    |

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