

# Instruction Manual

Grading machine type SE/ SET



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## 1.0 General description and scope of operations

Sorter type SE is designed to be used for the grading, by size, of potatoes, onions and similar products.

Normal operational working temperature: -15°C to + 40°C.

## 2.0 Installation

It is imperative that the grading machine stands upright and absolutely level, supported evenly on all four legs. Regulate the height of the legs by adjusting the machine shoes, (fig. 1).

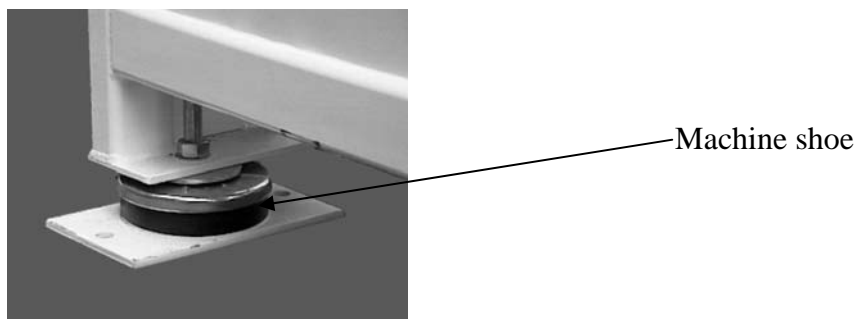


Fig. 1

**Before commencing operation, it is important to check that all nuts, bolts and screws are properly tightened.**

Steady and smooth operation is achieved by standing the grader on a 150 mm. thick, reinforced concrete floor which has been laid on a bed of stabilised, vibrated gravel.

Bolt the foot plates to the concrete floor with expansion bolts.

Connect the electricity supply in accordance with local regulations. Connect the electricity supply through a motor protection relay which corresponds to the size of the motor.

Check that the operational flow of the grader is correct. This is indicated by an arrow on the machine's eccentric wheel. Remove the transmission shield to check this. If the direction of flow is wrong, switch 2 phases in the power supply.

If the machine is supplied with an electrical lubricating system, this should be connected so that it operates only when the grader is running.

## 2.1 Installation of accessories

Follow the appropriate instructions when installing accessories

### 3.0 Conveyor

The cross-conveyors are independent of the sorter itself. For instructions referring to these, see enclosed instruction manual.

### 4.0 Operation

Check that the grader is correctly positioned in relation to other machines in the production sequence.

The forward movement of the riddle is regulated by loosening the handle with the symbol indicated in fig. 2 and sliding it further into the guide as necessary.

Do not attempt to regulate the forward movement of the riddle whilst the sorter is in operation, as the handle will kick violently back and forth in the guide.

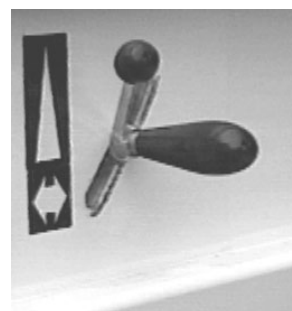


Fig. 2

The riddle's jump height is regulated by loosening the lock-nut on the handwheel, as indicated in fig. 3. The jump height position is registered by the indicator on the handwheel.



Fig. 3

The indicator is an optional extra on 'C' type models.

The removal of each riddle is carried out by turning both handles downwards. With both handles in this position, the riddle can be replaced and the riddle holders raised again.

The replacement of each riddle on 'C' type models (fig. 4) is carried out by loosening the four clasp locks on the sides. This is done by pressing down on the catch in the centre and lifting the handle upwards and outwards. Replace the riddle and press the locks into place again.



Fig. 4

## 5.0 Lubrication and maintenance

It is imperative that the idler roller which rotates on the eccentric is always well lubricated. It is therefore important that the oil reservoir is kept topped up.

The lubricating unit is adjusted at the factory to give the correct amount of lubrication, which is approximately 1 drop per minute. If necessary, this can be regulated by loosening the lock-nut and turning the regulating screw at the top of the unit, (see illustration).

'C' type sorters are fitted with a manually operated lubricator, which should be opened when the machine is started and closed when the machine is stopped (fig. 5).

To open: Rotate the pawl at the top of the lubricating unit into an upright position.

To close: Return the pawl to the horizontal position again.

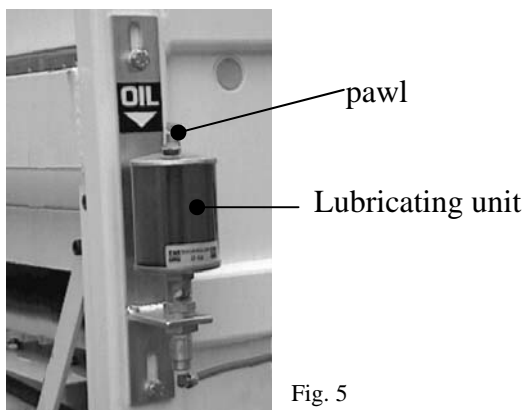


Fig. 5

Recommended lubricants:

Castrol	Magnaglide D68
Shell	Tonna 68
Exxon	FEBIS K68
Mobil	Vactra 2
BP	Maccurat 68

To avoid the oil sump (fig. 6) overflowing, check the container weekly and empty when full.

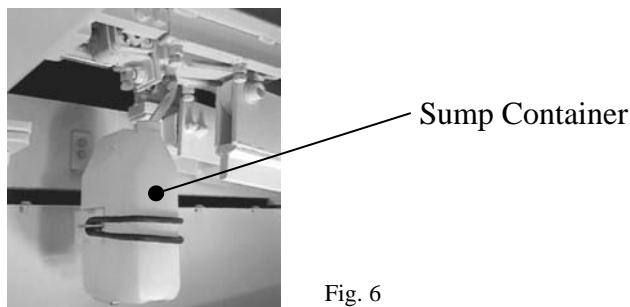


Fig. 6

To avoid unnecessary noise and wear, apply bearing grease daily to the four nylon buffers which hold the riddle case transversely (fig. 7).

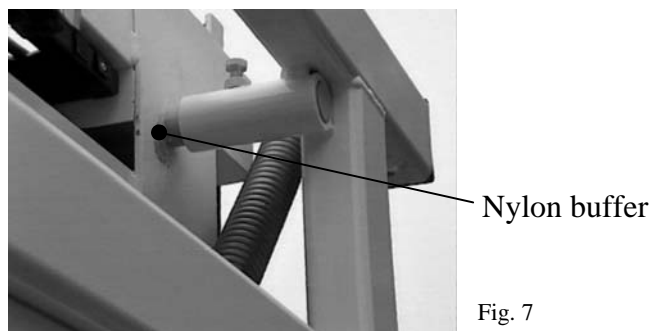


Fig. 7

Recommended grease

Castrol	LM NLGI 2,5
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Tolerance between the buffers and riddle case should not exceed 0.25 mm.

All other bearings are pre-lubricated and require no maintenance. However, after high pressure cleaning, all bearings must be greased with bearing grease.

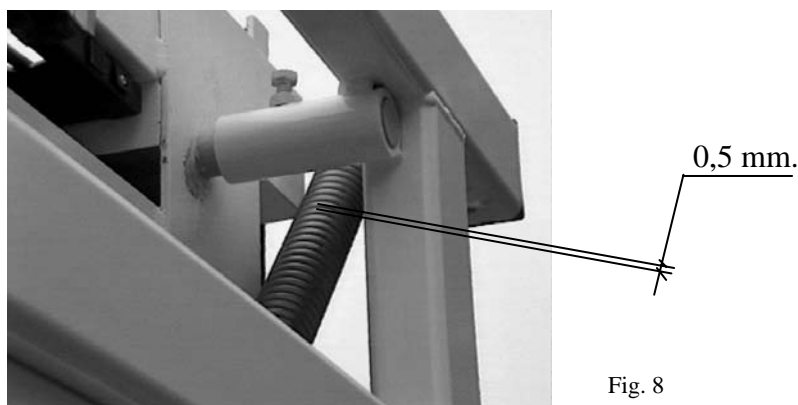
**Important!!** Avoid over greasing, as this can damage the bearing seals.

Recommended grease:

Castrol LM NGI 2.5

Check the drive belt tension periodically to ensure that the specified deflection is maintained. Adjustment is carried out by loosening the counter shaft and motor mounting bolts and subsequently adjusting until the required tension is achieved.

Re-tighten the bolts when finished.



It is very important to ensure that the riddle case springs are set at the correct tension of 0.5 mm. between turns (fig. 8).

It is very important to notice whether there is a gradual increase in noise level.

Contact our service department if any rise in noise levels cannot be reduced or eradicated by the recommended adjustments.

To maintain a noiseless operation, regularly check that all nuts, bolts and screws are properly tightened.

## 5.1 Cleaning

With reference to the Danish Plant Directorate's Order No. 965 of 13 December 1993 (p. 6).

- 2.3.3. Seed potato growers with contained propagation must clean and disinfect all sorting and ancillary equipment after each new variety. Disinfecting should be carried out using a product approved by The Danish Institute of Plant and Soil Science.
- 2.3.4. Companies authorised to sort potatoes and who also have the authorisation to propagate potatoes, must clean and disinfect sorting machinery etc. which is under the control of The Danish Plant Directorate before the sorting of own propagation is commenced. Disinfecting should be carried out using a product approved by The Danish Institute of Plant and Soil Science.
- 2.3.5. Premises and machinery etc. must be cleaned and disinfected each year before 30 June. Disinfecting must be carried out using a product approved by The Danish Institute of Plant and Soil Science.

In other countries, customers must conform to relevant, local food and hygiene regulations.

**Cleaning with a high pressure cleaner requires that the following parts are securely covered:**  
 Gearmotor, relay box and electrical control box.

In order to maintain effective production and keep maintenance costs at a minimum, regular lubrication, maintenance and cleaning are very important.

## 6.0 Packing and transport information

Packing / packaging:

Number of units:

The machine is packed as 1 unit.

Weight: (incl. conveyor)

SE603.....: 950 kg.

SE604.....: 1000 kg.

SE903.....: 1000 kg.

SE904.....: 1100 kg.

SET603.....: 950 kg.

SET604.....:1000 kg.

SET303.....:1000 kg.

SET904.....:1000 kg.

SE604C.....: 1000 kg.

SET603C.....: 950 kg.

SET604C.....:1000 kg.

SET903C.....: 1000 kg.

SET904C.....: 1100 kg.

Dimensions: in mm. (incl. conveyor)

	<b><u>Length</u></b>	<b><u>Width</u></b>	<b><u>Height</u></b>
SE603	3600	1550	1600
SE604	4700	1550	1600
SE903	3600	1850	1600
SE904	4700	1850	1600
SET603	3375	1650	1950
SET604	4450	1650	1950
SET903	3375	1950	1950
SET904	4450	1950	1950
SE604C	4600	1300	2110
SET603C	2800	1250	1675
SET604C	2800	1250	1860
SET903C	2800	1820	1675
SET904C	2800	1820	1860

## 7.0 Transport and lifting instructions.

Should it be necessary to lift the sorter, this must be carried out by attaching nylon straps to the grader's four legs, as shown in the illustration below (fig. 9).

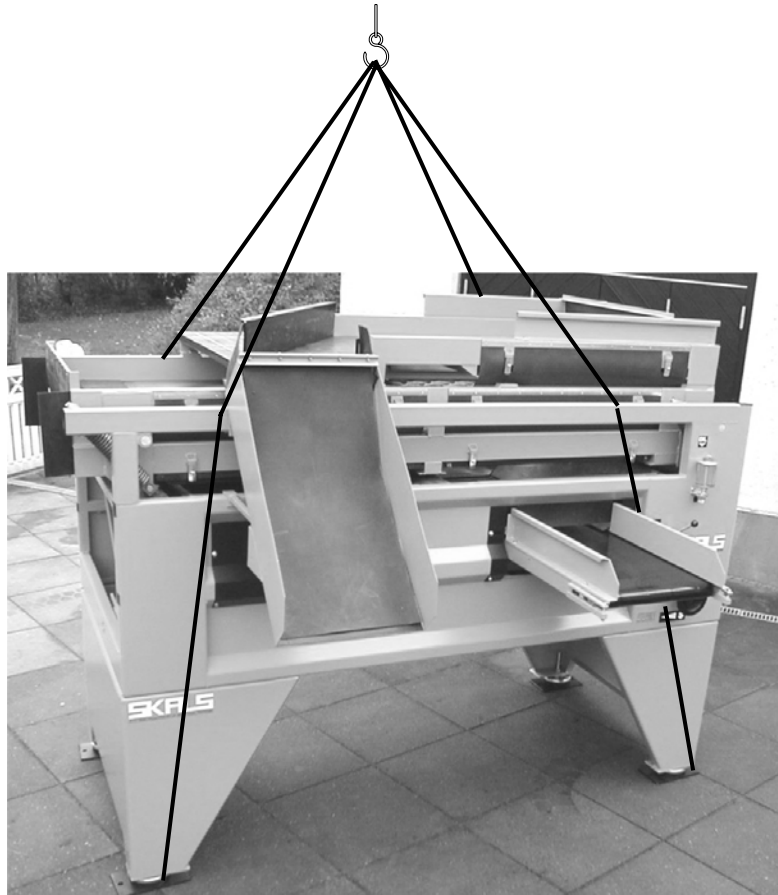


Fig. 9

## 8.0 Accessories

One or more extra longitudinal conveyors can be supplied in place of blind riddles. For further information about these, see the enclosed instructions.

## 9.0 Spare parts

The following pages contain a list of spare parts for the grader SE.

When ordering spare parts, please state type of machine, serial number and, if possible, the position number of the spare part.



Fig. 10

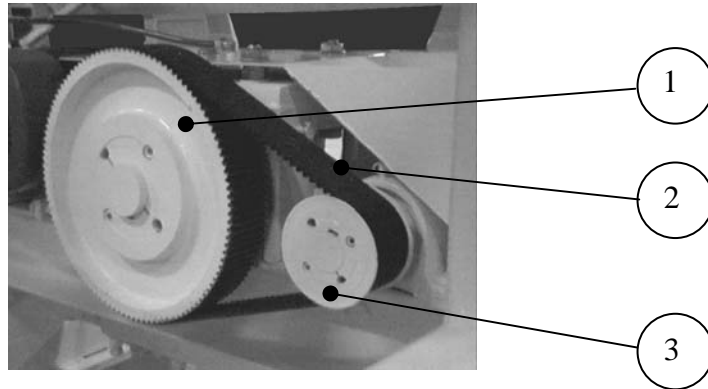


Fig. 11

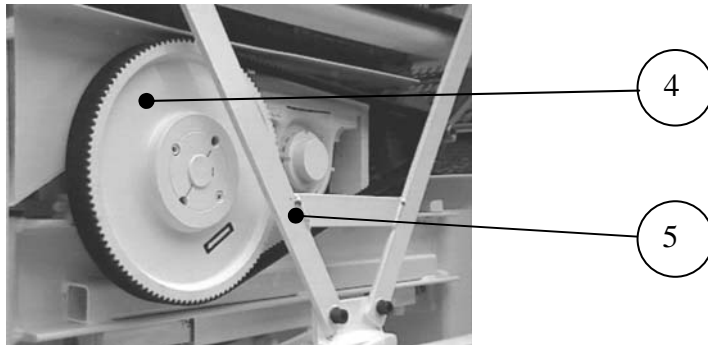


Fig. 12

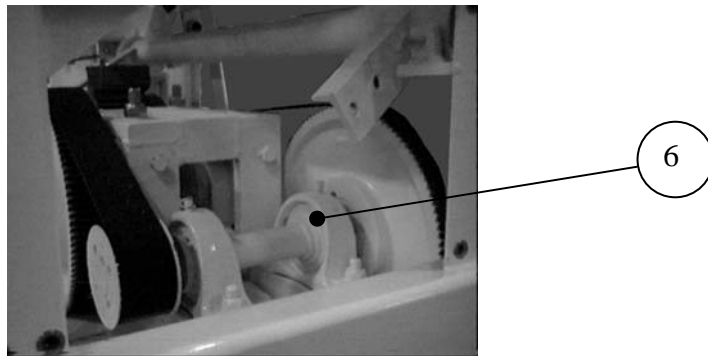


Fig. 13

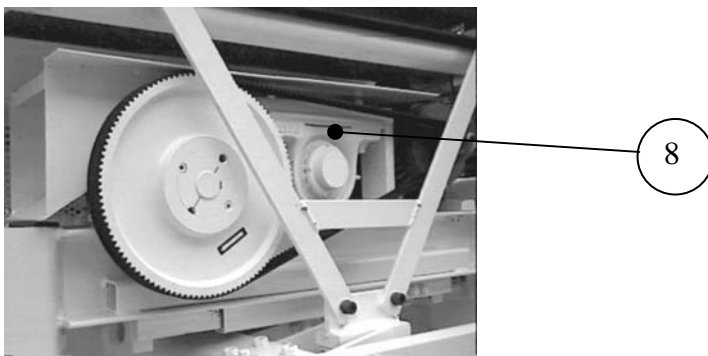
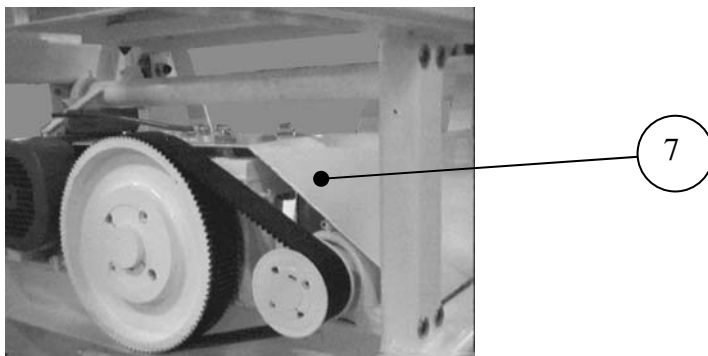


Fig. 14

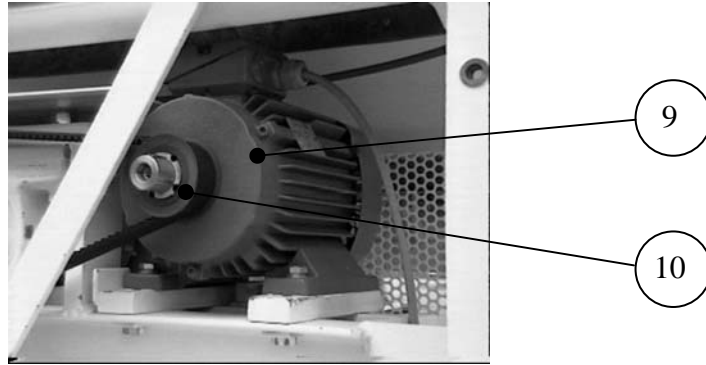


Fig. 15

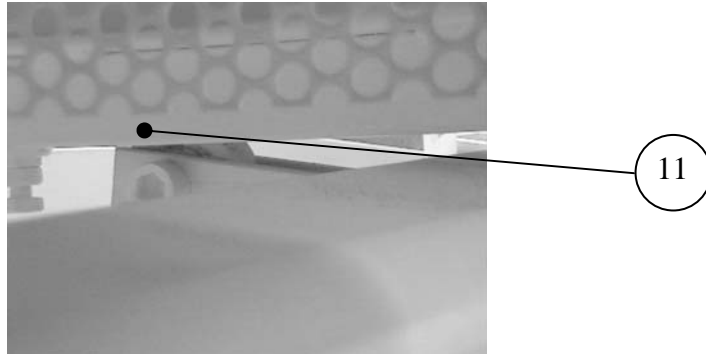


Fig. 16

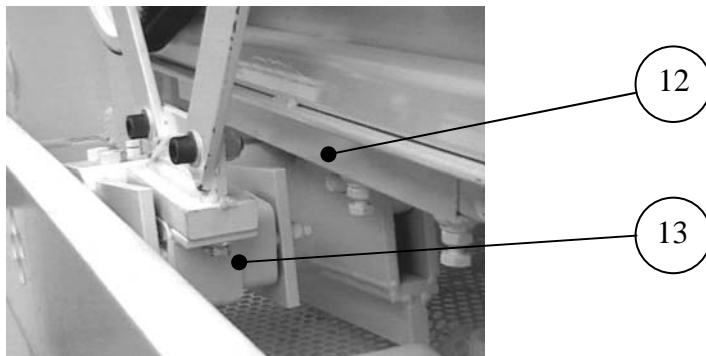


Fig. 17

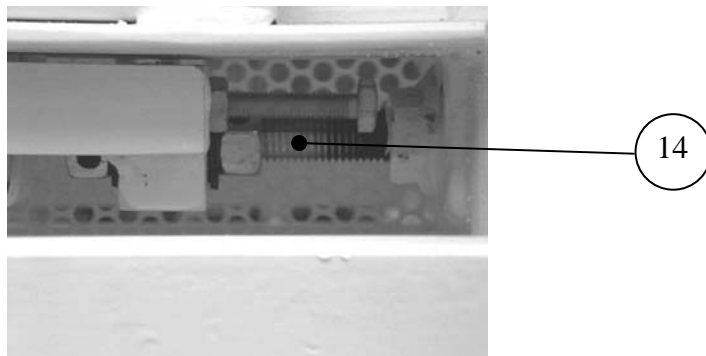


Fig. 18

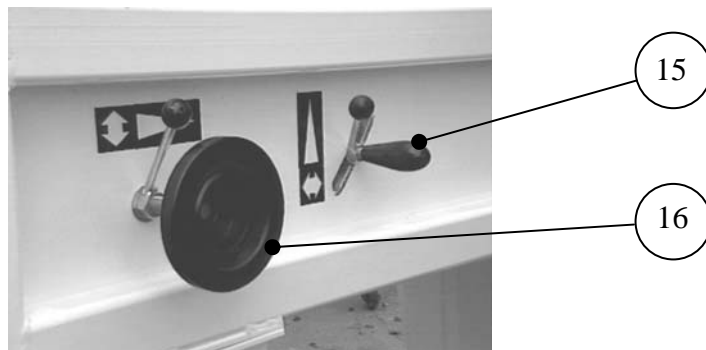


Fig. 19

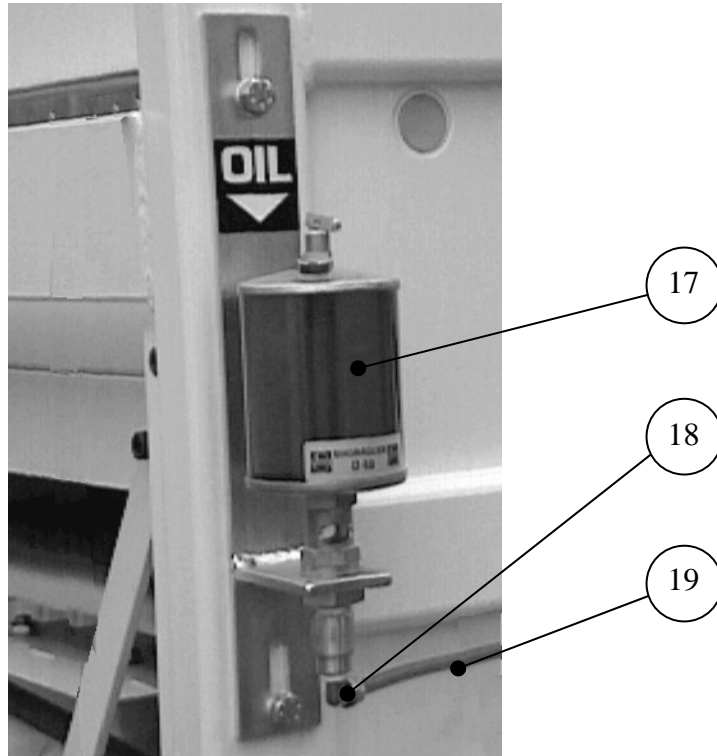


Fig. 20

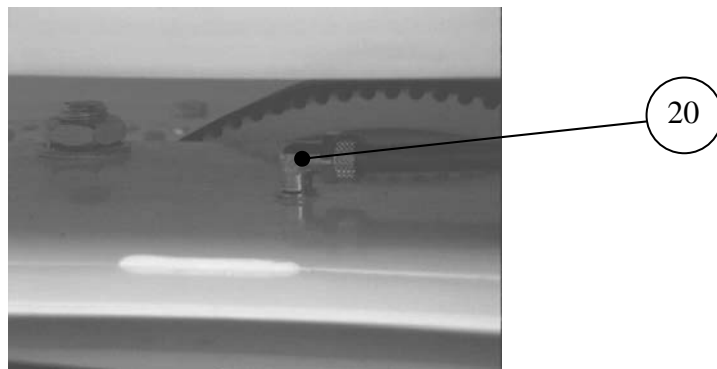


Fig. 21

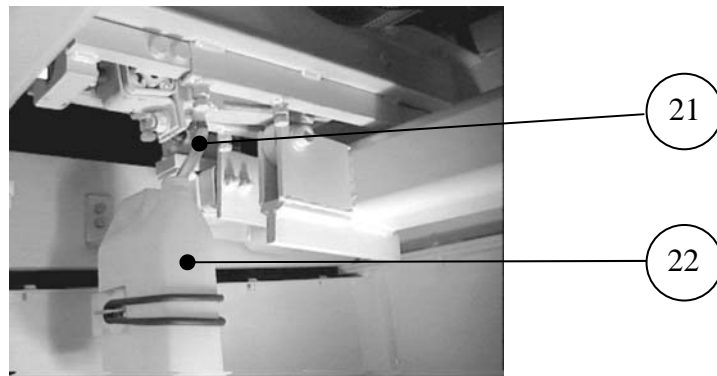


Fig. 22

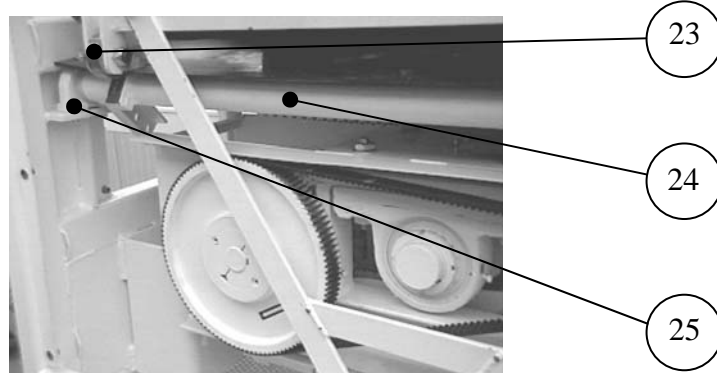
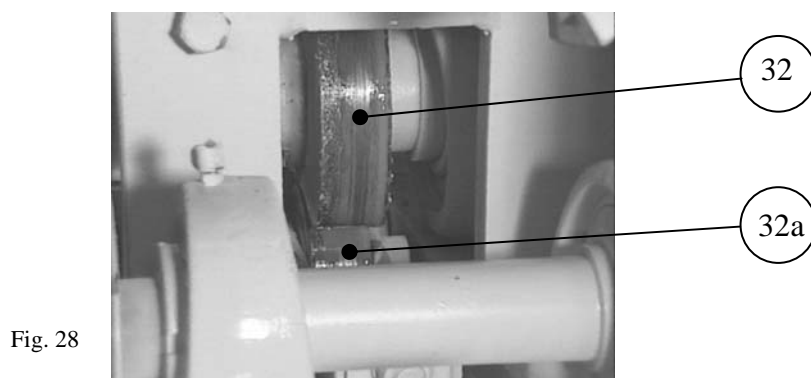
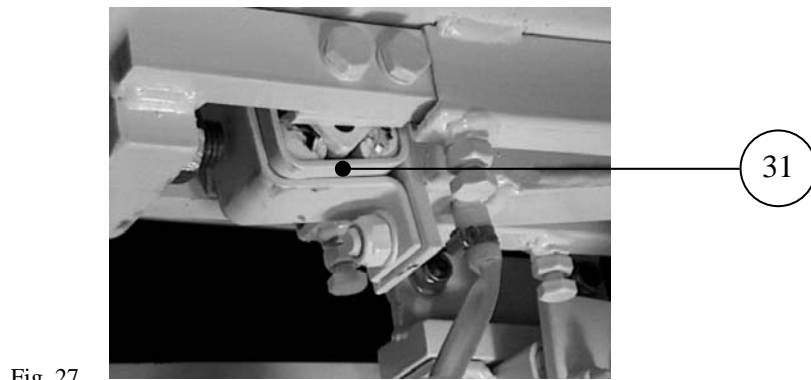
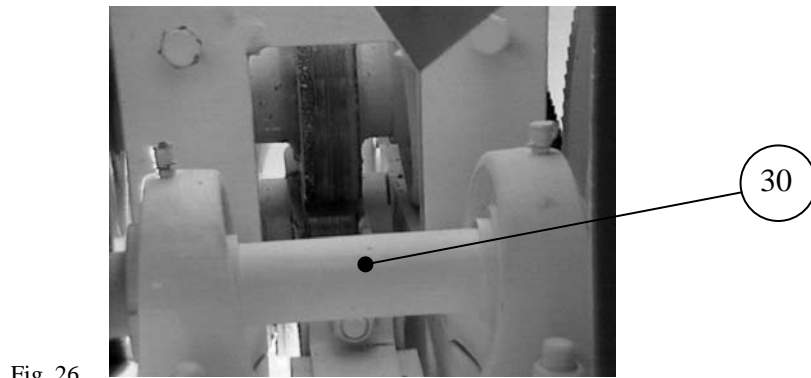
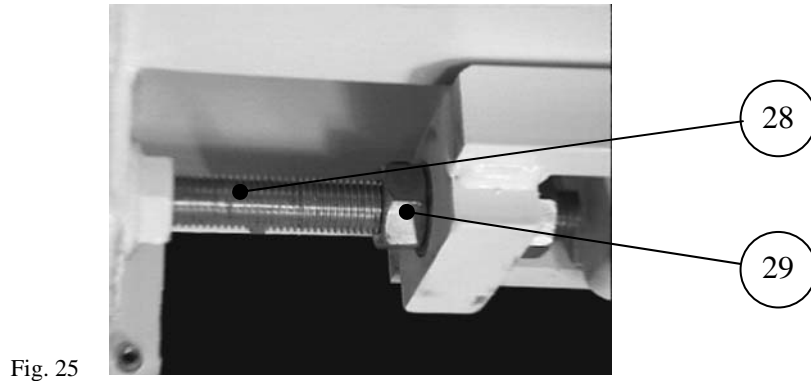
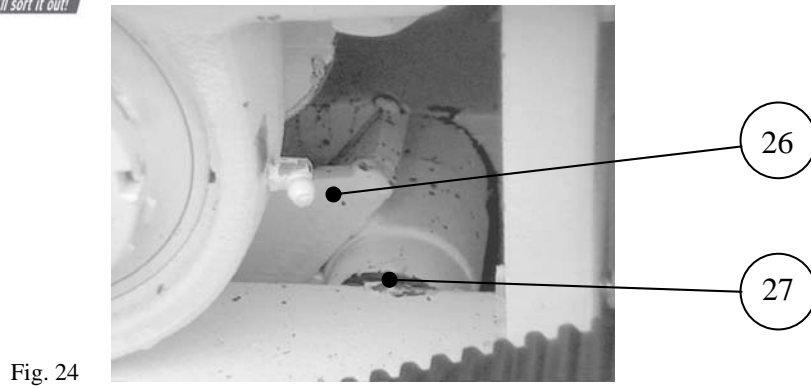


Fig. 23



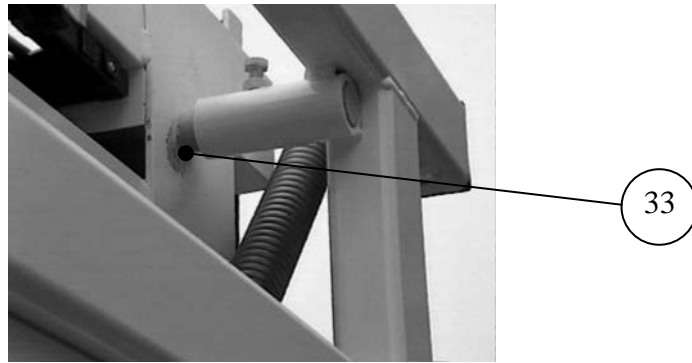


Fig. 29

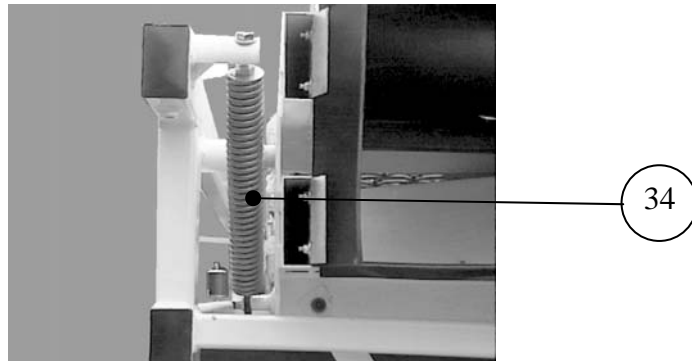


Fig. 30

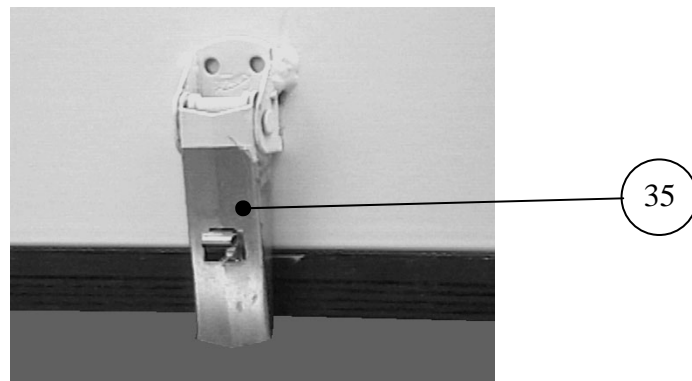


Fig. 31

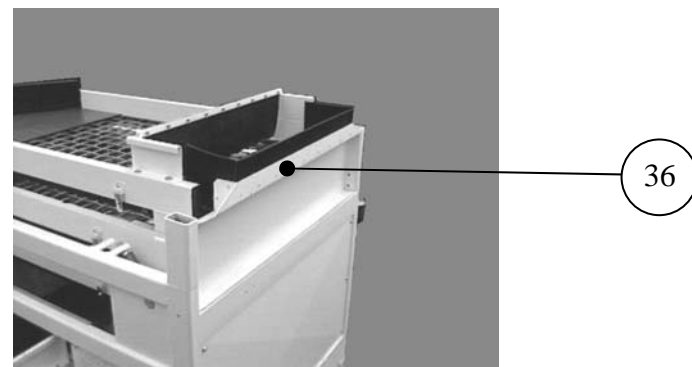


Fig. 32

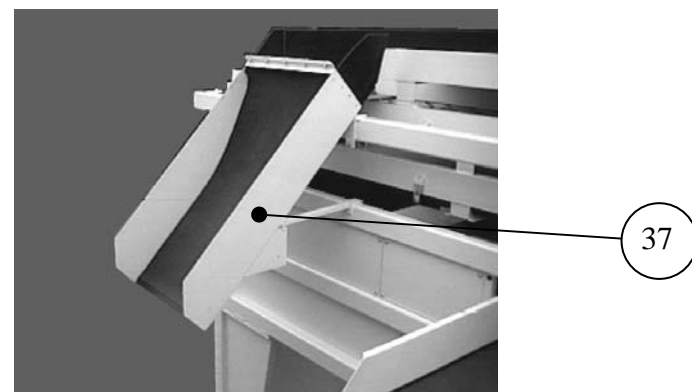


Fig. 33

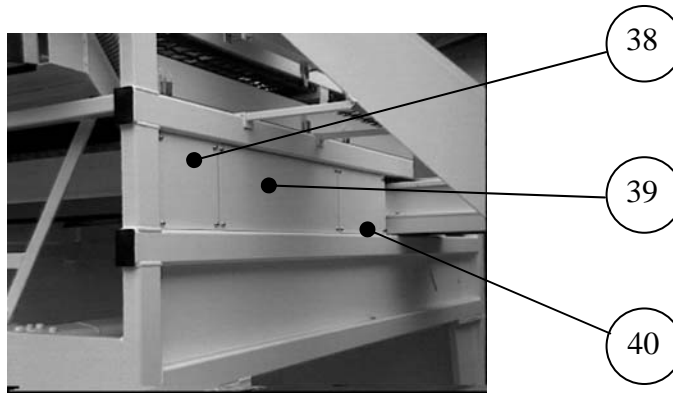


Fig. 34

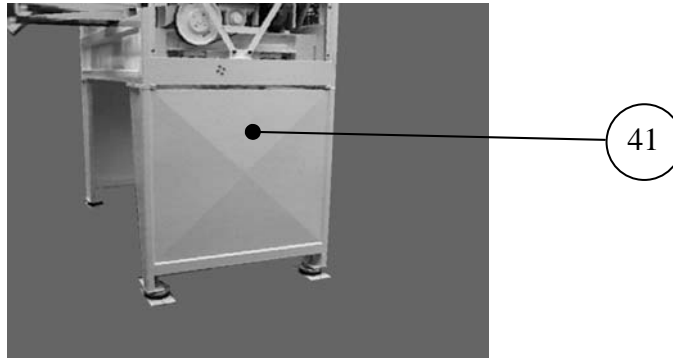


Fig. 35

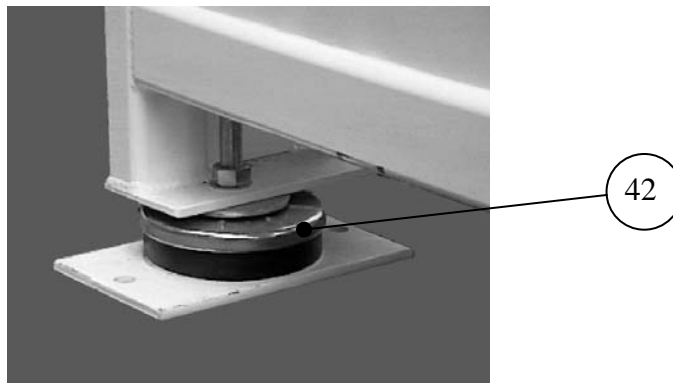


Fig. 36

Page	Fig no.	Pos. no.	Description
8	10	1	Main eccentric driving wheel
8	10	2	Eccentric driving belt
8	10	3	Small driving wheel
8	11	4	Large driving wheel
8	11	5	Riddle case bracket
8	12	6	Gear axle bearing
8	13	7	Motor shield
8	14	8	Eccentric bearing
9	15	9	Motor

9	15	10	Driving wheel
9	16	11	Lower rocker arm
9	17	12	Telescopic height adjuster
9	17	13	Rosta bearing suspension mounting, riddle support
9	18	14	Telescopic regulating screw
9	19	15	Riddle jump height adjustment
9	19	16	Riddle forward movement adjustment
10	20	17	Lubricating unit, oil reservoir
10	20	18	Lubricating unit, pipe junction
10	20	19	Lubricating unit, oil pipe
10	21	20	Lubricating unit, fittings
10	22	21	Lubricating unit, drain tube
10	22	22	Lubricating unit, sump
10	23	23	Riddle case bearing
10	23	24	Forward motion shaft
10	23	25	Forward motion shaft bearing
11	24	26	Upper rocker arm
11	25	27	Rocker arm guide
11	25	28	Threaded axle for adjustment of telescope
11	25	29	Special adjusting nut for threaded axle
11	26	30	Gear counter shaft
11	27	31	Rosta suspension mounting, rocker arm
11	28	32	Eccentric
11	28	32A	Bearing
12	29	33	Transverse nylon buffer
12	30	34	Tension spring for riddle case
12	31	35	Clasp lock for riddle case
12	32	36	Feeder channel
12	33	37	Chute
13	34	38	Little side screen
13	34	39	Large side screen
13	34	40	Centre side screen
13	35	41	Legs
13	36	42	Machine shoe



**10.0 Declaration of conformity with EU.**

<b>Manufacturer</b>	
Firm:	A/S Skals Maskinfabrik
Address:	Hovedgaden 56 8832 Skals, Denmark
Telephone:	87 25 62 00

declares herewith, that

<b>Machine:</b>	<b>Grading machine</b>
Brand:	<b>SE-SET900</b>
Type, serial no., year:	

Is manufactured in accordance with the decisions of the Councils Directives:

- 1 Machinery Safety – Directive 98/37/EC
- 2 Low Voltage Equipment Directive (LVD) 2006/95/EEC
- 3 Electromagnetic Compatibility (EMC) Directive 89/336/EEC and 93/68/EEC as amended.

<b>Title:</b>	Productions Manager
Name:	Søren Lund Madsen
Firm:	A/S Skals Maskinfabrik

Date: \_\_\_\_\_

Signed: \_\_\_\_\_

