FUJI IX PROCESSOR

Model FIP4000

Mechanical Service Manual

Fuji Photo Film Co., Ltd.

Tokyo Japan

TABLE OF CONTENTS

SPECIFICATIONS

Type: Continuous roller transport system

Processing Time: 5 minutes and 11 minutes from developing to drying

Film Processed: Max. width; 17". Min. length; 6"

Processing Capacity: Simultaneous feeding in 4 rows (3-1/2" width)

5-min. Processing-- 450 sheets/hour (3-1/2x10)

11-min. processing-- 225 sheets/hour (3-1/2x10)

Tank Volumes: Developer; 30 liters (8 gallons)

Fixer; 24 liters (6-1/2 gallons)

Wash water; 22.5 liters

Wash Water Temperature: 31°C (87.8°F)

Wash Water Flow Rate: 10 liters/min. (Only while processing)

Temperature Control Systems:

Developer; Automatic temperature control by means of a heat exchanger (1000W heater/cooling water) and a thermistor. Digital temperature display

Fixer; Automatic temperature control by means of a heat exchanger (1000W heater/cooling water) and a thermistor

Dryer; The preset temperature is maintained via a thermo-controller (ON/OFF control) which continuously operates while films are being processed.

Wash water; The specified temperature is maintained by means of a mixing valve.

Circulation Systems:

Continuous circulation provided to both the developer and fixer through circulation pumps. A filter package is assembled in the developer circulation line to maintain developer quality.

Replenishment Systems:

When films are fed, replenishment pumps are turned on due to signals from the photo-sensors at the film entrance section. By controlling the adjusting knob, replenishment rates can be set at any desired amount.

Circuit Breakers;

Developer & Fixer;

Safety thermostat (45°C) cuts circuits to prevent overheating of chemistries.

Dryer:

A safety thermostat (80°C) and fuses (3 pieces of 150°C ratings) prevent dryer from overheating.

Materials: High quality stainless steel and specially composed resins

Power Requirements:

AC220V 3-phase 3-wire, 50/60Hz, 5.5 KVA max.
1-phase 2-wire

Dimensions: Length; 802 mm (1165mm including feeding table and dryer cover)

Width: 800 mm

Height: 1200 mm

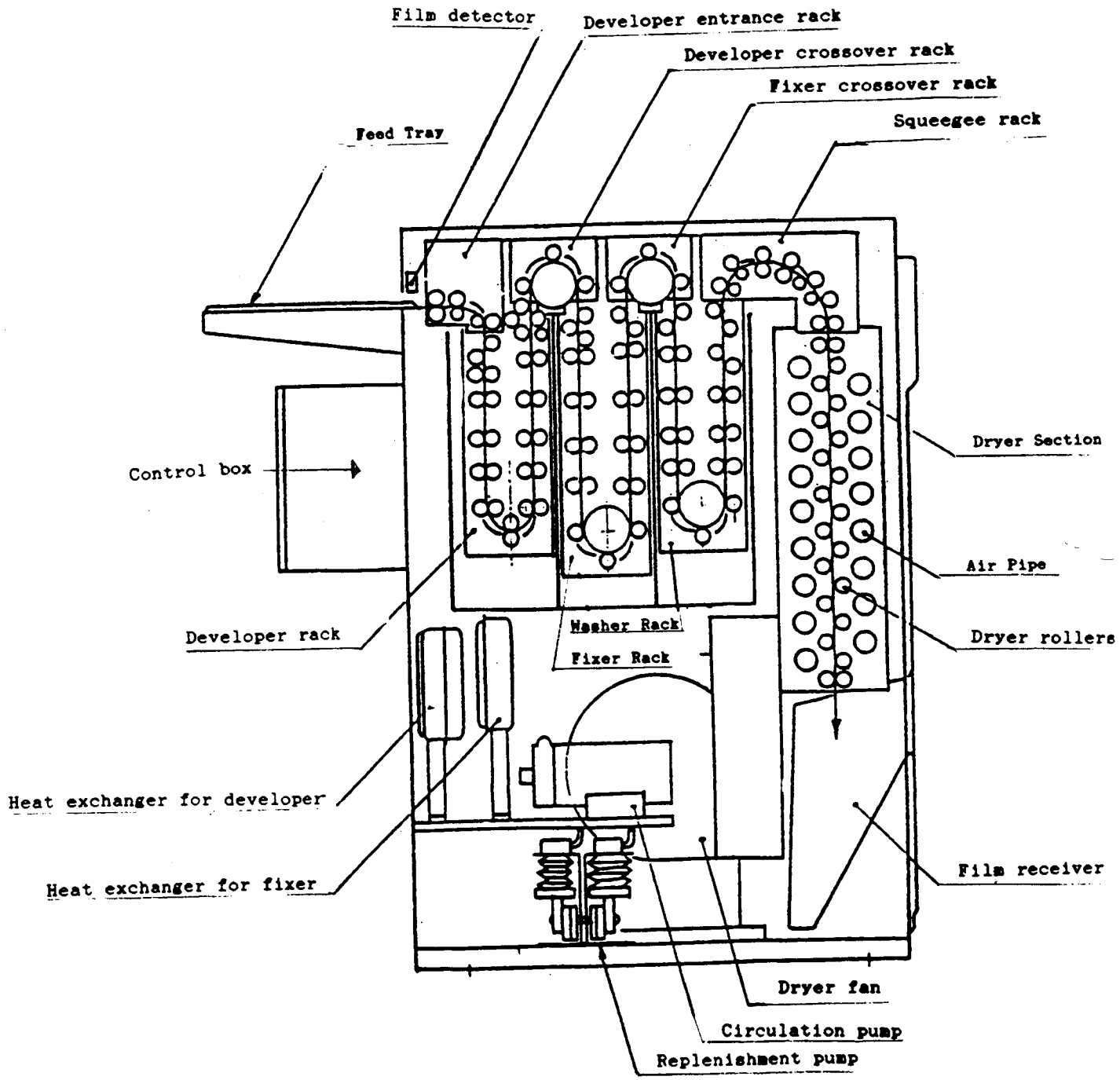
Weight: Body 294 kg (648 lbs)
With chemistries 370 kg (816 lbs)

Accessories: Replenishment tanks, Rack hoist, Manual handle, Mixing rod, Replenishment rate measurement cylinder, Flow valve, rack trays, Chemistry protecting cover, Wash water filter element, Developer filter element (spare), tools, Repair parts kit.

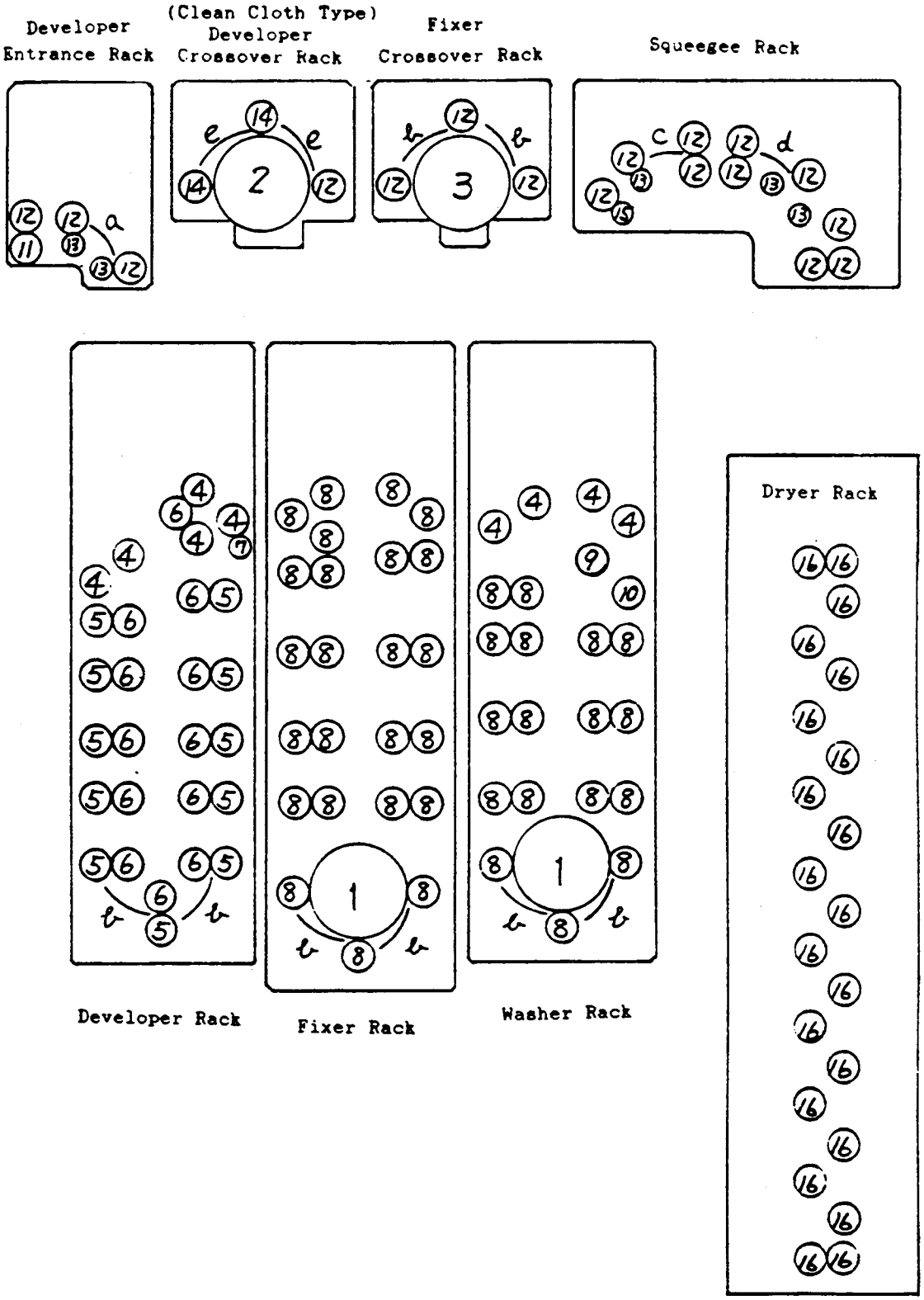
Optional accessories:

Autofeeder IX, Autofeeder support, water panel with water solenoid valve and thermostatic mixing value.

COMPONENT LOCATIONS AND NAMES



ROLLER AND GUIDE PLATE ARRANGEMENTS



- The figures in circle correspond to the numbers in the specification table.
- The small case letters correspond to the guide place specification table.

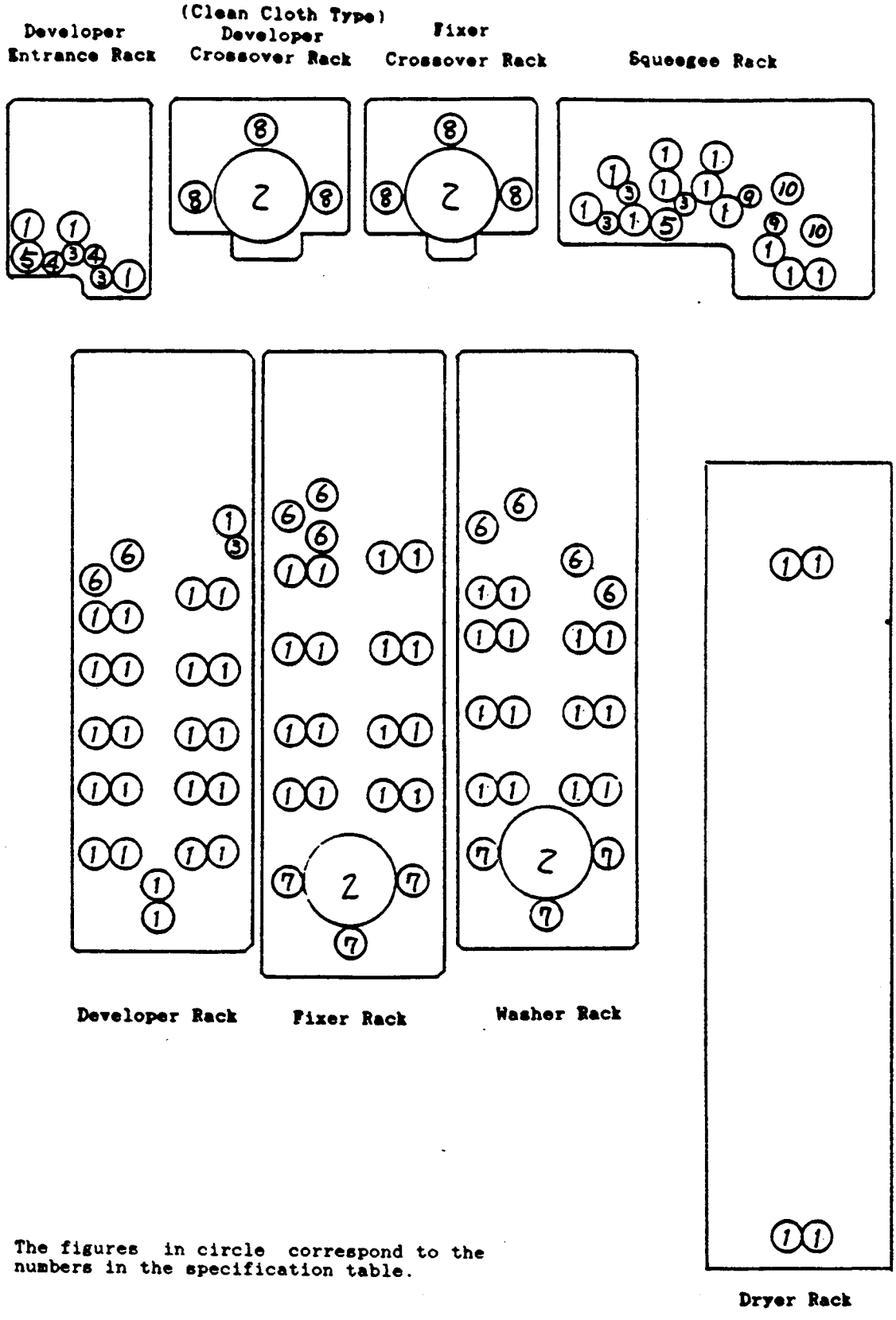
Roller Specifications

No.	PART NO.	MATERIAL	Q'TY	ASSEMBLY	REMARKS
1	334F2272A	Phenol resin resin	11	Fix & washer rack	
2	334F0007A	Phenol resin	1	Dev. crossover rack	Teflon cover
3	334F2275A	Phenol resin	1	Fix crossover rack	
4	334F2273	Acryl	9	Dev. & washer rack	
5	334F2252	Phenol resin	11	Dev. rack	
6	334F3099A	EPT Rubber	12	Dev. rack	
7	334F3103	EPT Rubber	1	Dev. rack	
8	334F2251	Phenol resin	41	Fix & washer rack	
9	334F5013	Capron/phenol resin	1	Washer rack	
10	334F5014	Capron/phenol resin	1	Washer rack	
11	334F2277	Phenol resin	1	Dev. entrace rack	
12	334F2276	Phenol resin	17	Ent., cross, etc.	
13	334F2274	Phenol resin	5	Dev.ent. Squee. rack	
14	334F0008	Phenol resin	2	Dev. crossover rack	Teflon cover
15	334F3102	EPT Rubber	1	Squeezee rack	
16	334F8617160	Phenol resin	21	Dryer section	

Guide Plate Specifications

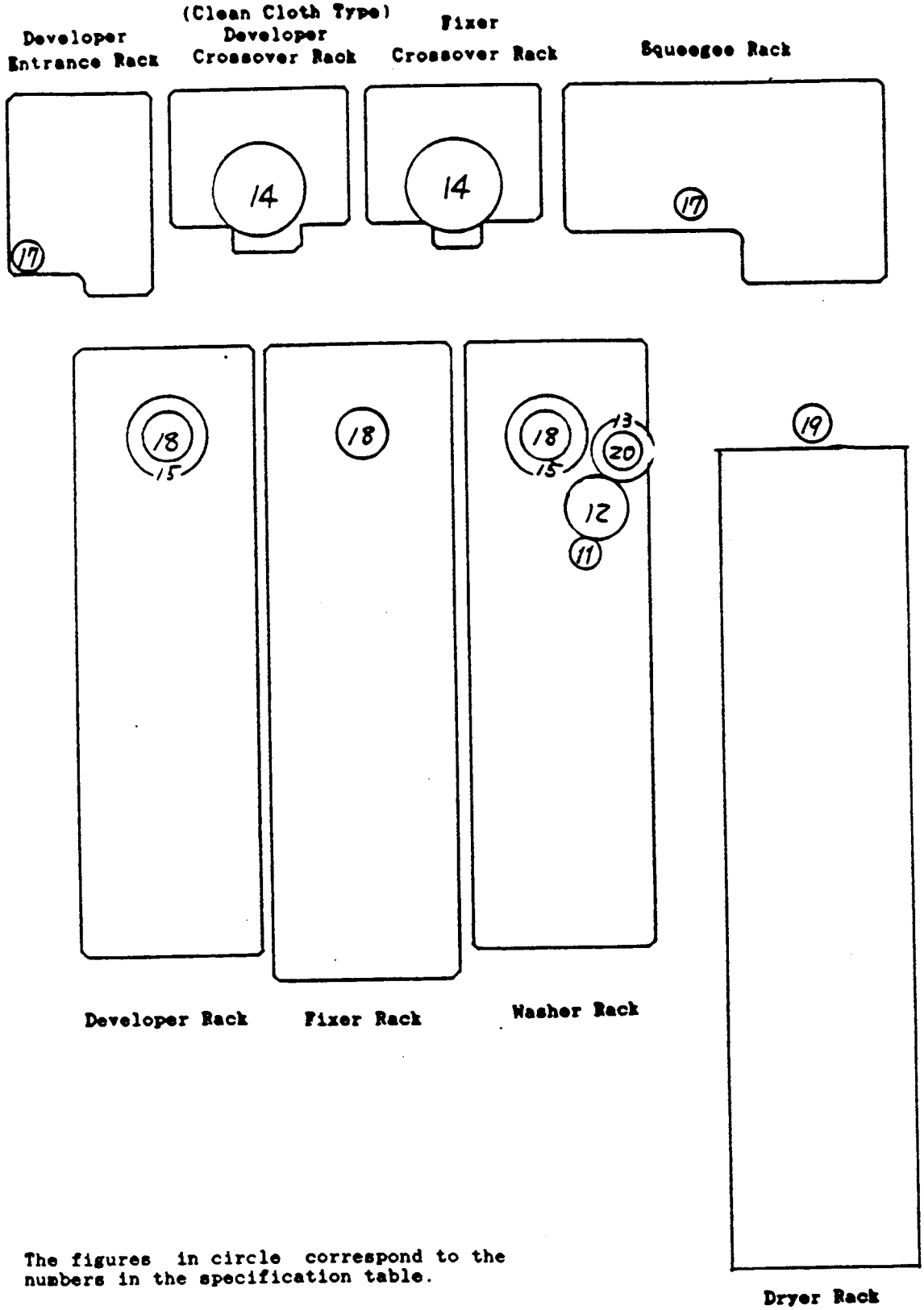
SYMB	PART NO.	ANGLE			Q'TY	ASSEMBLY	REMARKS
		R	θ	a. mm			
a	363F0571A	R31	66	34.8	1	Dev. entrance rack	Embossed
b	363F0572A	R40	65	43.8	8	Dev. & Fix racks etc.	Embossed
c	363F0573A	R54	27	25.6	1	Squee. rack	w/rib
d	363F0574A	R54	39	36.5	1	Squee. rack	w/rib
e	363F0678	R40	70	45.9	2	Dev. crossover rack	w/rib

Gear Arrangements at freewheel side



• The figures in circle correspond to the numbers in the specification table.

Gear Arrangements at drive shafts side

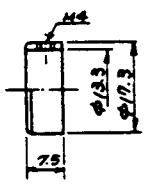
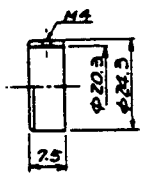
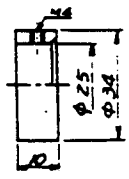


• The figures in circle correspond to the numbers in the specification table.

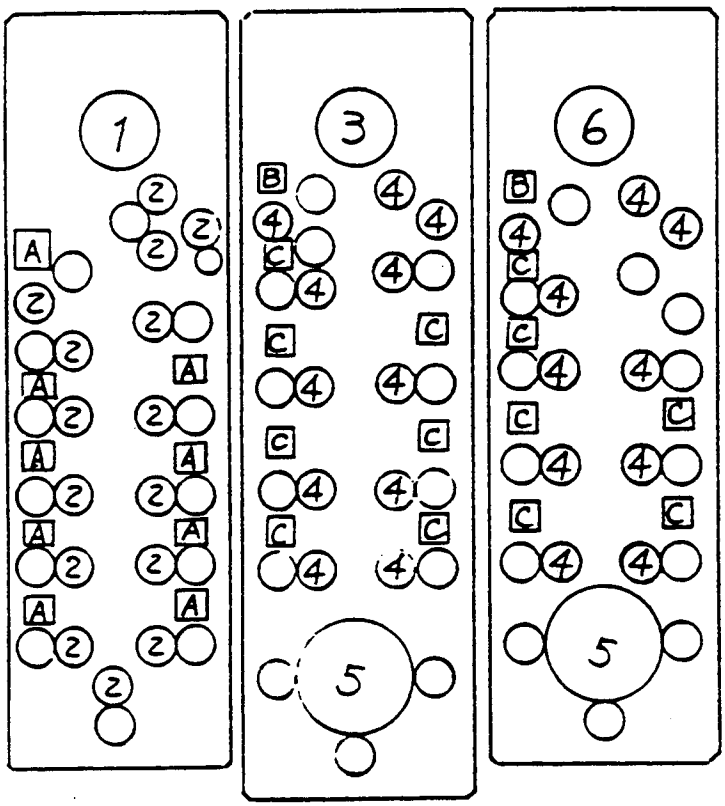
Gear Specifications

No.	PART NO.	MATERIALS	Q'TY	ASSEMBLY	HUB RING
1	327F1122006	PBT	71	All racks	A
2	327F1126001	GLASS NYLON	4	Dev.Fix rack/cross	B
3	327F1121601	PBT	6	Dev., Ent. Squ. rack	A
4	327F1121603	PBT	2	Dev. ent. rack	-
5	327F1122013	MC NYLON	2	Dev. ent. sque. rack	A
6	327F1122401	PBT	9	Dev. fix wash racks	A
7	327F8614142	GLASS NYLON	6	Fix & wash rack	A
8	327F8613321	GLASS NYLON	6	Dev.& Fix cross	A
9	327F8613542	SUS	2	Squeezee rack	-
10	327F8613541	GLASS NYLON	2	Squeezee rack	A
11	327F1122014	NYLON	1	Washer rack	A
12	327F1123801	NYLON	1	Washer rack	-
13	327F1123202	NYLON	1	Washer rack	-
14	327F1127201	GLASS NYLON	2	Dev. & Fix cross	B
15	327F1126002	SUS	2	Dev. & Wash rack	-
17	327F5151803	MC NYLON	2	Ent. & squee. rack	B
18	327F5154501	MC NYLON	3	Dev. Fix. Wash rack	C
19	327F5153601	MC NYLON	1	Dryer rack	C
20	327F2151311	NYLON	1	Washer rack	-

Hub-ring Specifications

MARK	A	B	C
PART #	338F8614182	338F0105	338F8614184
Q'TY	103	8	4
DIMENSIONS			

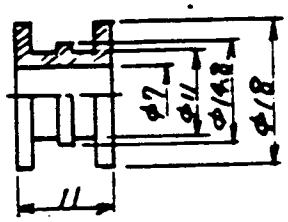
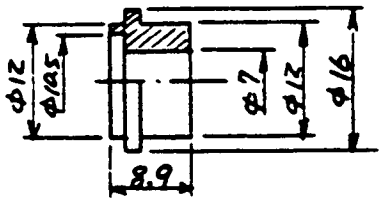
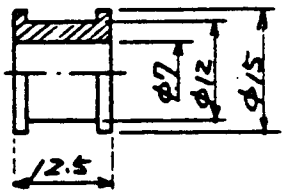
ARRANGEMENTS AND SPECIFICATIONS OF SPROCKET AND TENSION PULLEY



Sprocket Specifications

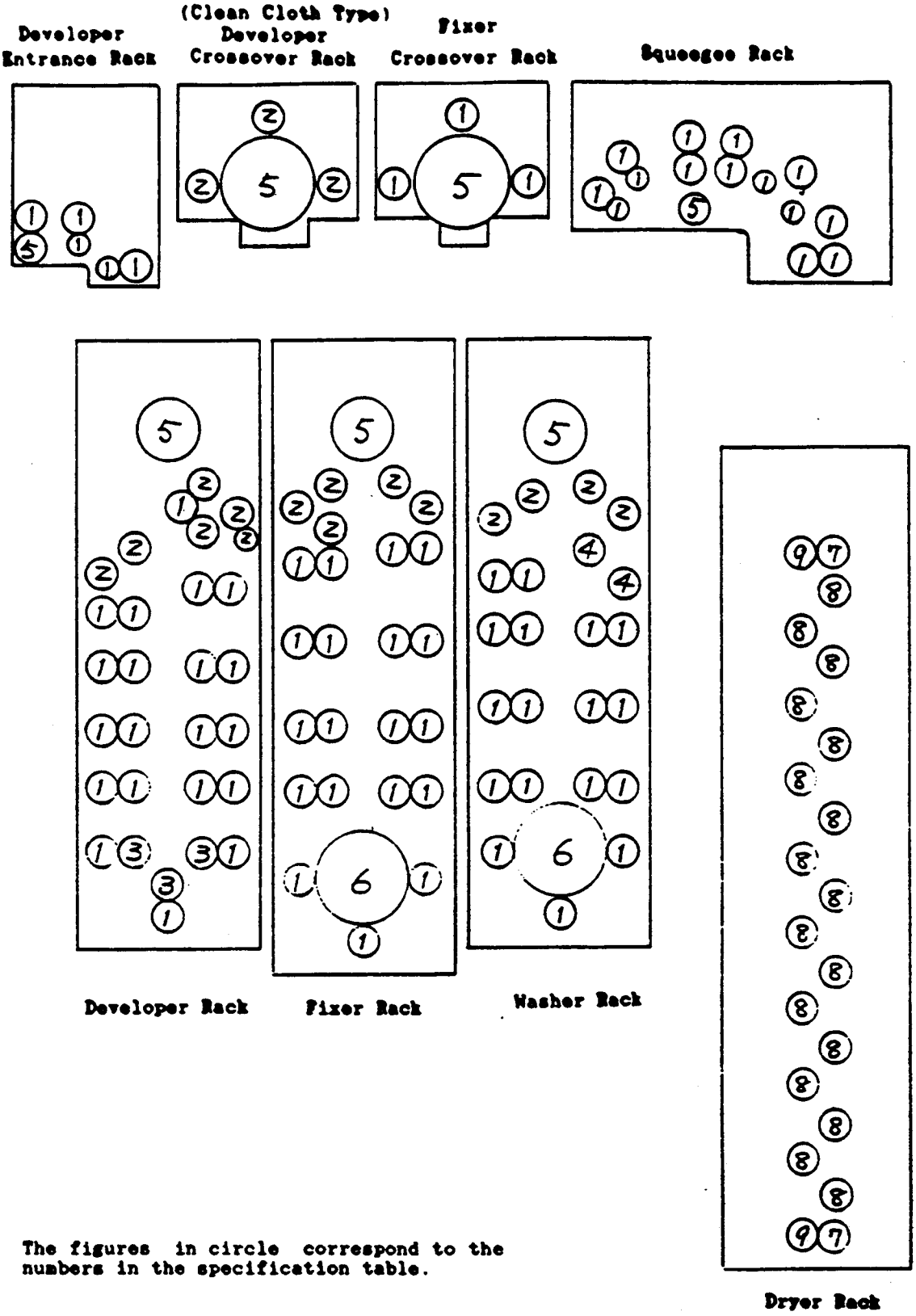
NO.	PART NO.	CHAIN NO.	Q'TY	ASSEMBLY	NO. OF TEETH
1	326F2015501	RS11	1	Dev. rack	55
2	326F2012201	RS11	15	Dev. rack	22
3	326F1013005	RS25	1	Fix rack	30
4	326F1011211	RS25	21	Fix & wash rack	12
5	326F1013604	RS25	2	Fix & wash rack	36
6	326F1013004	RS25	1	Wash rack	30

Tension Roller Specifications

MARK	PART #	DISMENSIONS	Q'TY	ASSEMBLY
A	338F0149		9	DEVELOPER RACK
B	362F0234		1	FIXER RACK
			1	WASHER RACK
C	338F0150		7	FIXER RACK
			6	WASHER RACK

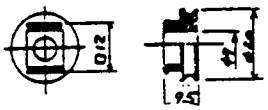
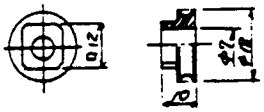
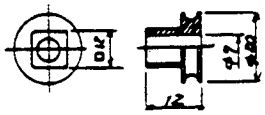
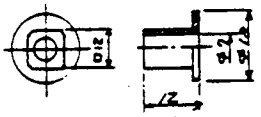
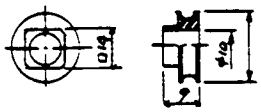
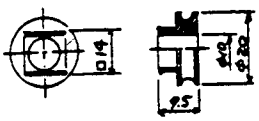
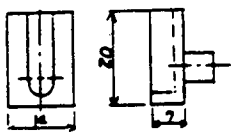
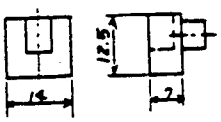
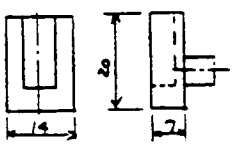
BEARING ARRANGEMENTS AND SPECIFICATIONS

Bearing Arrangements



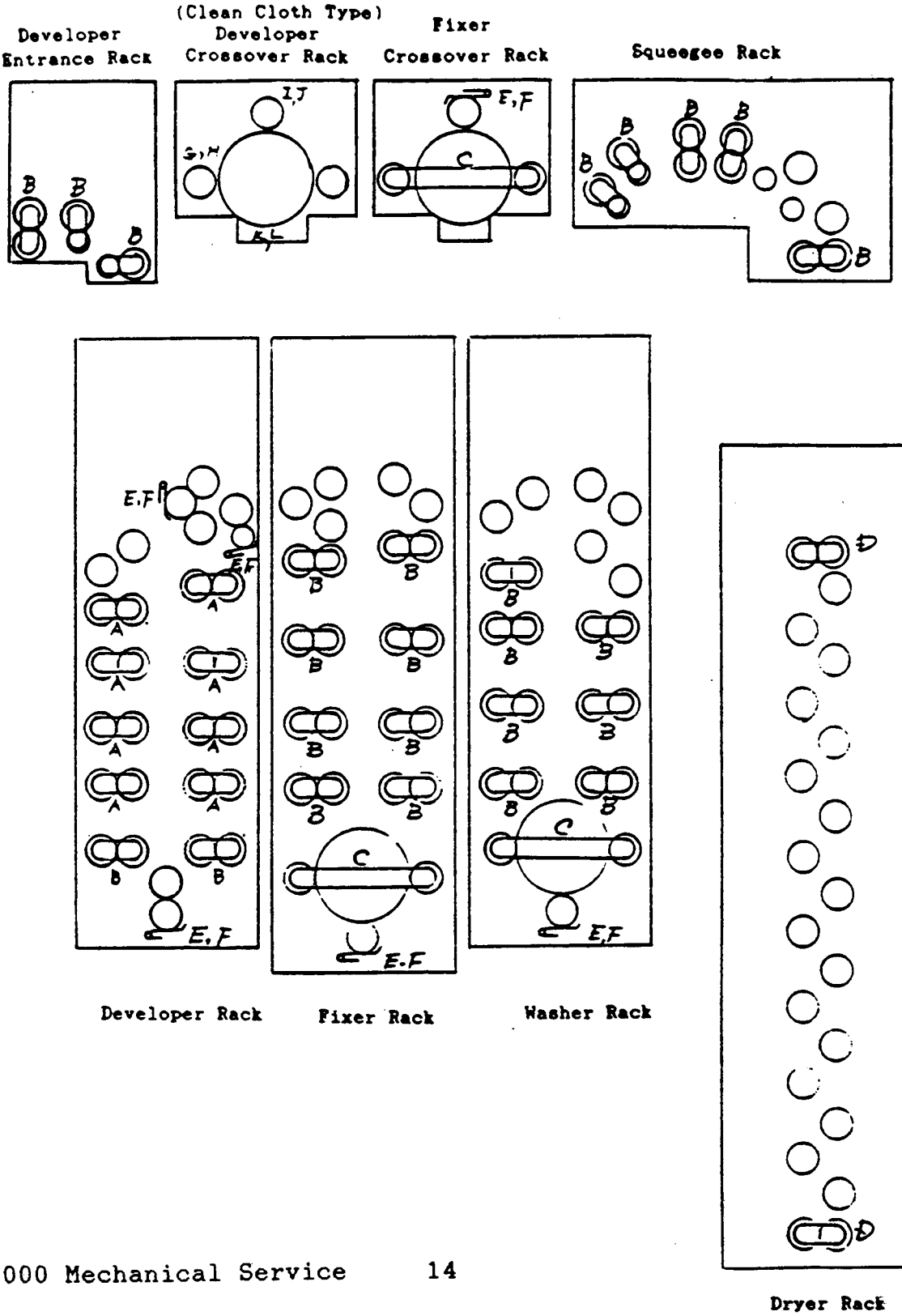
• The figures in circle correspond to the numbers in the specification table.

Bearing Specifications

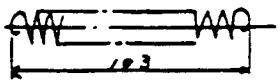
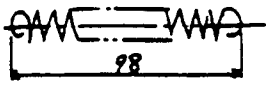
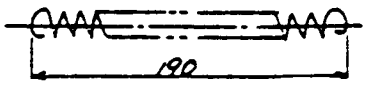
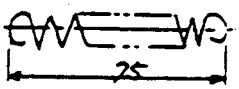
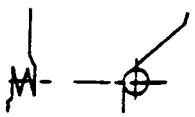
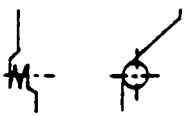
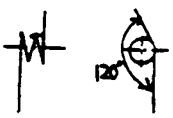
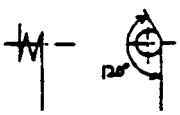
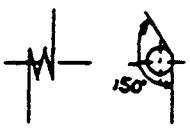
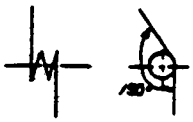
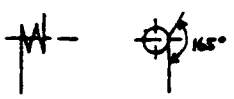
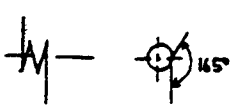
NO	PART #	DIMENSIONS	Q'TY	ASSEMBLY
1	322FC049		10 40 38 34 6 28	DEV. ENTRANCE RACK DEV. RACK FIXER RACK WASHER RACK FIXER CROSSRACK SQUEEGEE RACK
2	322FC091		12 10 8 6	DEV. RACK FIXER RACK WASHER RACK DEV. CROSSRACK
3	322FC094		6	DEV. RACK
4	322FC093		4	WASHER RACK
5	322FC092		2 2 2 2 2 2 2	DEV. RACK FIXER RACK WASHER RACK DEV. ENTRANCE RACK DEV. CROSSRACK FIXER CROSSRACK SQUEEGEE RACK
6	322FC050		2 2	FIXER RACK WASHER RACK
7	362F8319429		4	DRYER RACK
8	362F8317211		34	DRYER RACK
9	362F8317212		4	DRYER RACK

SPRING ARRANGEMENTS AND SPECIFICATIONS

Spring Arrangements

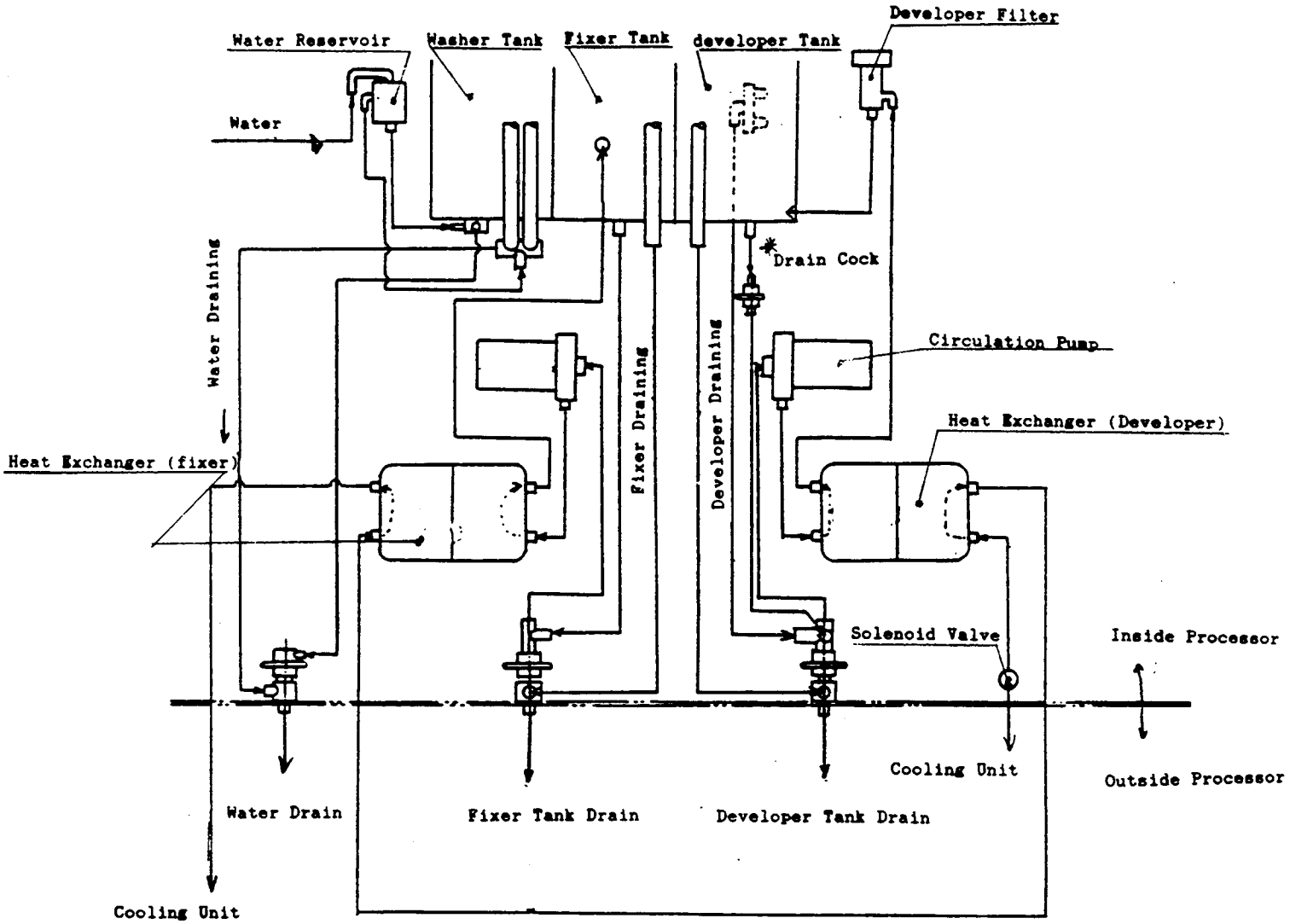


Spring Specifications

MARK	PART #	DIMENSIONS	Q'TY	ASSEMBLY
A	388F2069		16	DEV. RACK
B	388F2073		4 16 14 6 10	DEV. RACK FIXER RACK WASHER RACK DEV. ENTRANCE RACK SQUEEGEE RACK
C	388F2072		2 2 2	FIXER RACK WASHER RACK FIXER CROSSRACK
D	388F8234413		4	DRYER RACK
E	388F3046		3 1 1 1	DEV. RACK FIXER RACK WASHER RACK FIXER CROSSRACK
F	388F3045		3 1 1 1	DEV. RACK FIXER RACK WASHER RACK FIXER CROSSRACK
G	388F3047A		1	DEV. CROSSRACK 1st thin (Freewheel side)
H	388F3052A		1	DEV. CROSSRACK 1st thin (Drive side)
I	388F3054		1	DEV. CROSSRACK 2nd thin (Drive side)
J	388F3055		1	DEV. CROSSRACK 2nd thin (Freewheel side)
K	388F3050A		1	DEV. CROSSRACK Thick roller (Drive side)
L	388F3049A		1	DEV. CROSSRACK Thick roller (Freewheel side)

CIRCULATION SYSTEM DIAGRAM

Circulation, Replenisher, and Water Supply System Chart



* Note: Developer drain cock is opened only for draining chemical. During operation, this cock should be closed. After refilling g developer, be sure to close the cock securely.

MECHANICAL DATA

1. Processing Speed

   Short cycle (5 min): 9.9 mm/sec

   Full cycle (11 min): 5.0 mm/sec

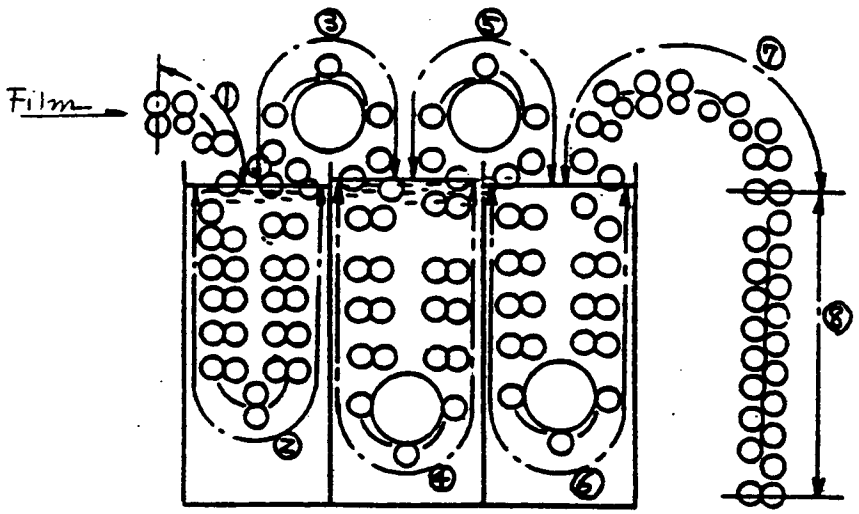
2. Processing Cycle Time (Total throughput processing time)

   Short cycle (5 min): 5 min. 28 sec.

   Full cycle (11 min): 10 min. 52 sec.

3. Processing Steps

		DEVELOPER		FIXER		WASHER		
	INSERTION	In	Out	In	Out	In	SQUEEZ	DRYER
Mark	①	②	③	④	⑤	⑥	⑦	⑧
Short (sec)	15	60	30	65	30	60	35	50
Long (sec)	30	120	60	130	60	120	70	100



4. Temperature Rise Rate

At normal room temperature (70°F) and humidity, the developer, fixer and dryer temperatures reach the specified temperature in time indicated below.

Developer	From 73.0°F to 86.0°F in 17 min. (0.72°F/min)
Fixer	From 70.0°F to 88.0°F in 18 min. (1.08°F/min)
Dryer	From 70.0°F to 131.0°F in 12 min. (5.04°F/min)

5. Rack Weights

Developer Rack	19 kg (42 lbs)
Fixer Rack	17 kg (37 lbs)
Wash Rack	16 kg (35 lbs)
D. Entrance Rack	4 kg (9 lbs)
D. Crossover Rack with Clean Cloth	6 kg (13 lbs)
Fixer Crossover Rack	5 kg (11 lbs)
Squeegee Rack	8 kg (18 lbs)

6. Drain Time

Developer	2 min 30 sec
Fixer	2 min
Wash	2 min

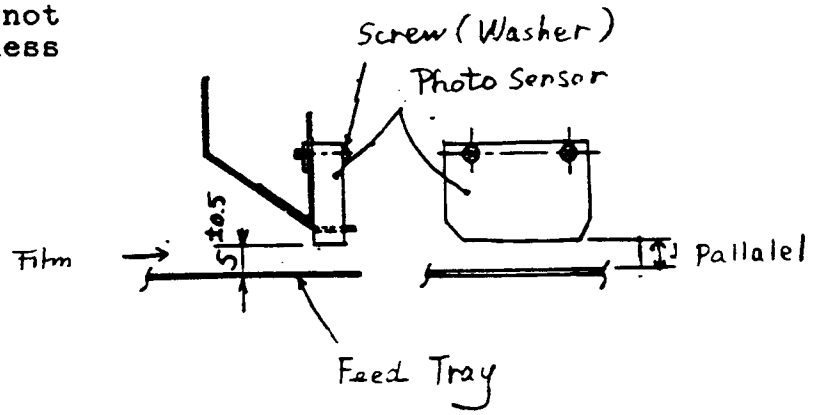
7. Sprockets (RS-25)

	Motor Sprockets	Drive Sprockets
Short Cycle (5 min)	21 teeth	15 teeth
Full Cycle (11 min)	21 teeth	30 teeth

ADJUSTMENTS

1. Film Detector

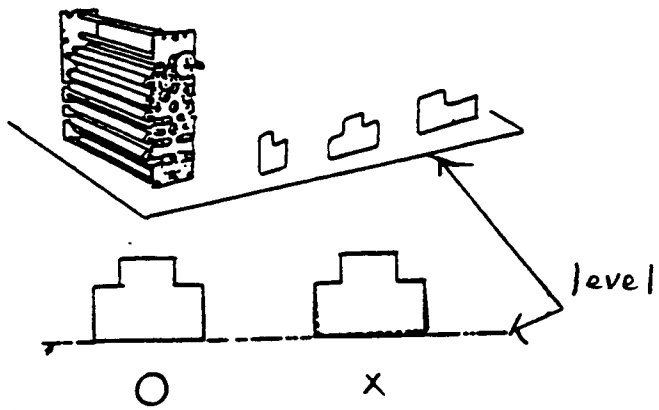
Referring to the illustration, loosen the fixing screws. Insert the jig, then tighten the screws. The detector should be set in parallel to the film - surface and its clearance is 5 mm ±0.5. When the jig is not available, use a thickness gauge.



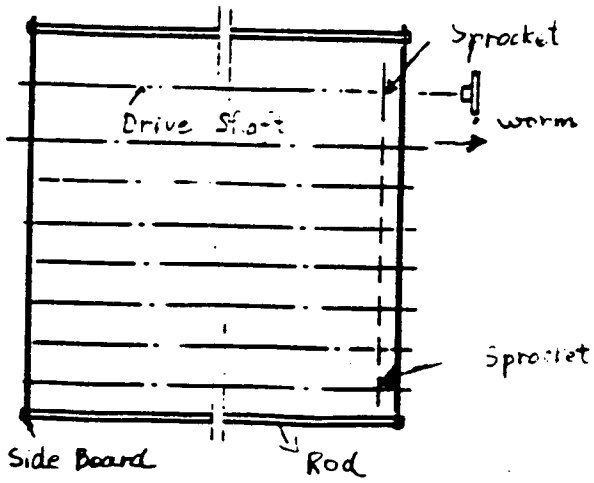
2. Rack

2-1. Rack distortion

- Make sure that the rack sits flush on the flat platform surface.
- When checking the racks for distortion, place the developer, fixer and wash racks on the flat surface in the upright position and the entrance, developer crossover, fixer crossover and squeegee racks upside down.
- If any of the racks are found to be distorted, loosen the rack configuration retention bolts and straighten its geometry.



2-2. Chain alignment (Developer, fixer and wash racks)



When any rollers are out of alignment, rollers do not rotate uniformly, causing uneven processing. Check and adjust roller rotation in the following manner.

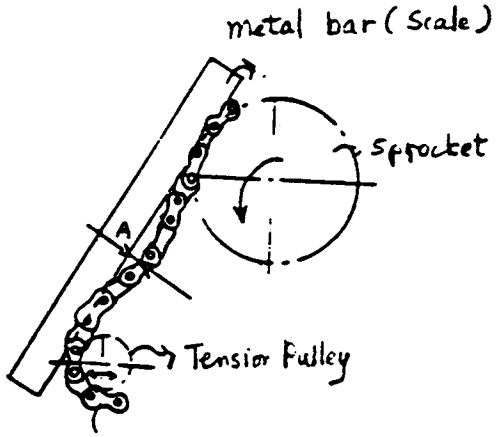
°Turn the worm gears clockwise and make sure that they turn freely.

°If a worm gear cannot be turned freely and lightly, or if there is some excessive resistance, or if any of rollers do not rotate while the worm gear is turned, adjust chain according to the procedures indicated below.

1. Loosen the hexagonal nut of the large chain sprocket.
2. Firmly set the smaller chain sprockets to the smaller rollers (O.D. 25mm) at the correct position.
3. Turn quickly the worm 7 to 8 times.
4. Tighten the hexagonal nut of the large chain sprocket.
5. Turn the worm clockwise and make sure that they turn freely.

2-3. Ladder chain tension

Check the ladder chain for proper tension. If the chain is too slack the rollers will not rotate evenly. If the tension is not sufficient, reduce the slack using the following procedure.



Loosen the nut and adjust the play (A) in the ladder chain to the specified amount by moving the tension pulley.

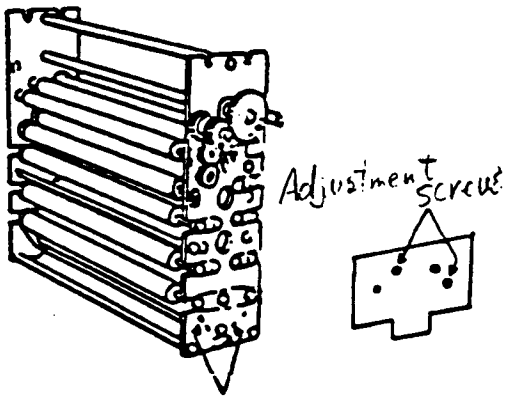
Approriate setting of "A"

Developer rack	(A)=8±1mm
Fixer rack	(A)=6±1mm
Wash rack	(A)=6±1mm

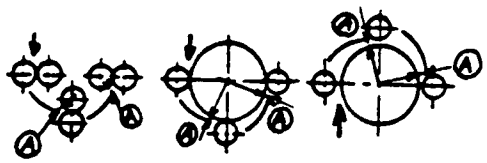
Note: Firmly tighten the nut of tension pulley shaft.

2-4. Turn guide plates (Developer, fixer, wash, developer crossover, and fixer crossover racks)

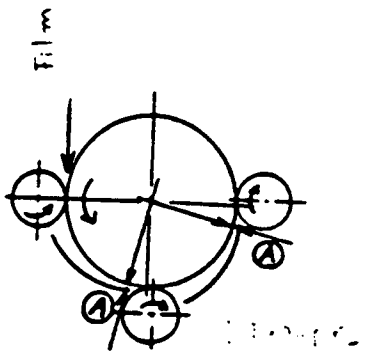
- Turn screws at both side plates and adjust (A) to obtain the specified clearance between roller surface and guide plate edge.
- Use a thickness gauge, or sheets of film. The thickness of one sheet of film is about 0.2mm..
- Adjust the amount so that the guide plate is aligned at both sides.



Adjustment Screw



Developer rack:	(A)=1.5 to 2.5 mm
Fixer rack:	(A)=1.5 to 2.5 mm
Wash rack:	(A)=1.5 to 2.5 mm
D/F crossover:	(A)=2.5 to 3.5 mm
F/W crossover;	(A)=2.0 to 3.0 mm



- After adjustment, make sure screws are tighten up firmly.
- Process several sheets of film to make sure guide plates are set at the right position.
- Whenever there is an indication that they are out of alignment, re-adjust guide plates.

Note:

a. Guide plates of the entrance and squeegee racks need no adjustments.

b. Make sure a guide plate is installed in the right direction in right and left sides to align with the length of roller.

2-5. Gears and bearings

- Check the gears and bearings for damage or excessive wear and replace any that are compromised beyond use.
- Make sure that each bearing is set with an E-ring.

2-6. Springs

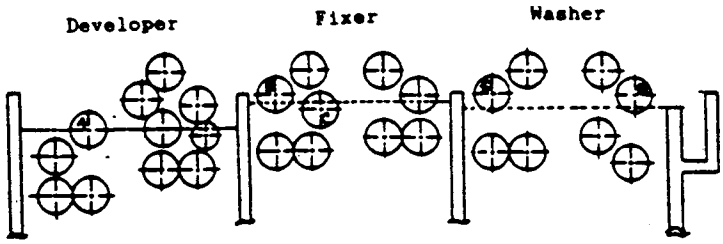
Check to insure that none of the springs are out of place, fatigued or broken. If out of place, reinstall correctly and replace if found defective.

3. Chemicals Circulation Line

3-1. Chemical level (Developer, fixer and wash)

- Only the developer tank allows level adjustment.

Standard level

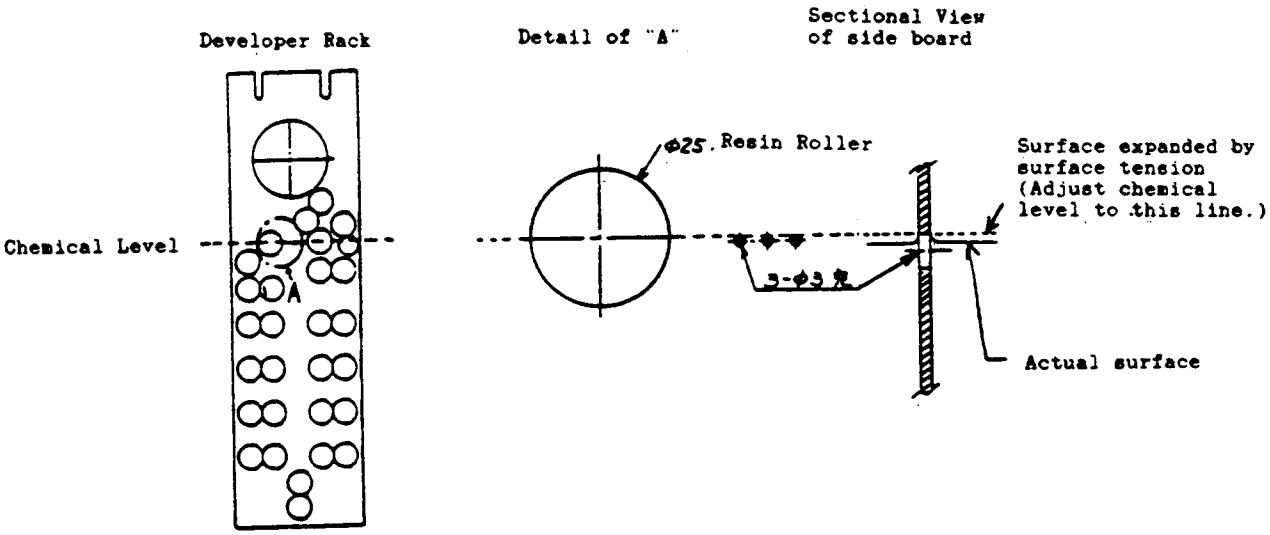


At the A Roller Center

At the position obtained by dividing the distance between B and C rollers by 2

At the position where D and E rollers are submerged under water by about 1/4.

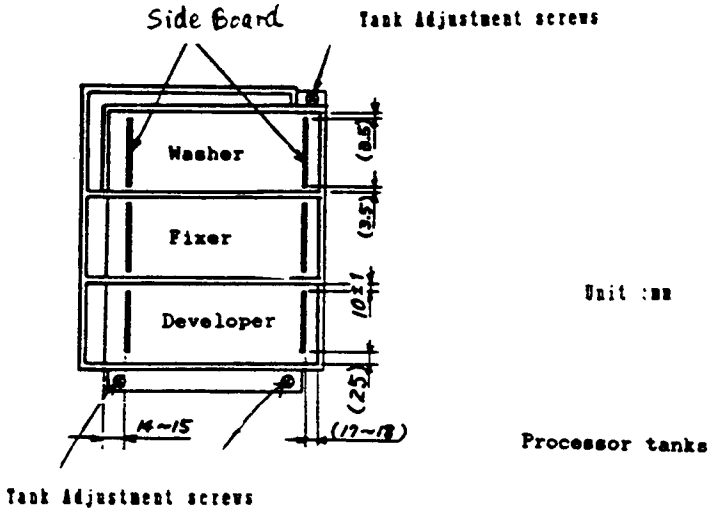
Chmical level adjustments



- Adjust the overflow nozzle so that surface tension level comes to the position.
- Tighten the nut to fix the overflow nozzle position.

3-2. Chemical tank

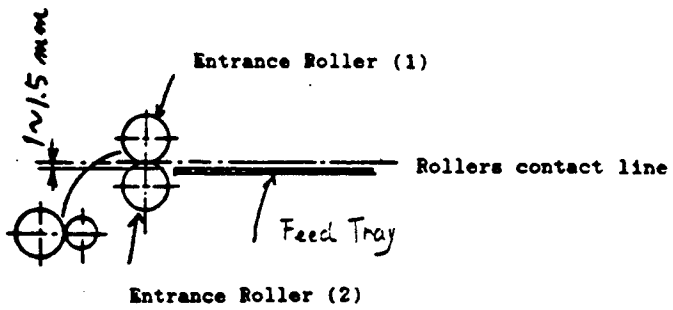
Referring to the numbers shown in the diagram below, adjust chemical tank positioning by loosening 3 screws.



4. Feed Tray

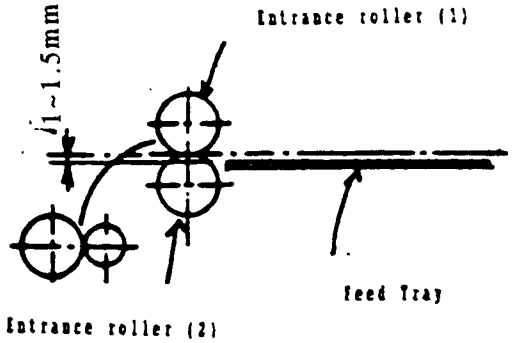
Incorrectly assembled feed tray may cause scratches on the film surface. Adjust the feed tray in the following manner.

Remove roller (1), and insert a film. Make sure the film leading edge touches with roller (2). Set the feed tray so that the tray surface is placed 1 to 1.5mm lower from the contact point of two entrance rollers.

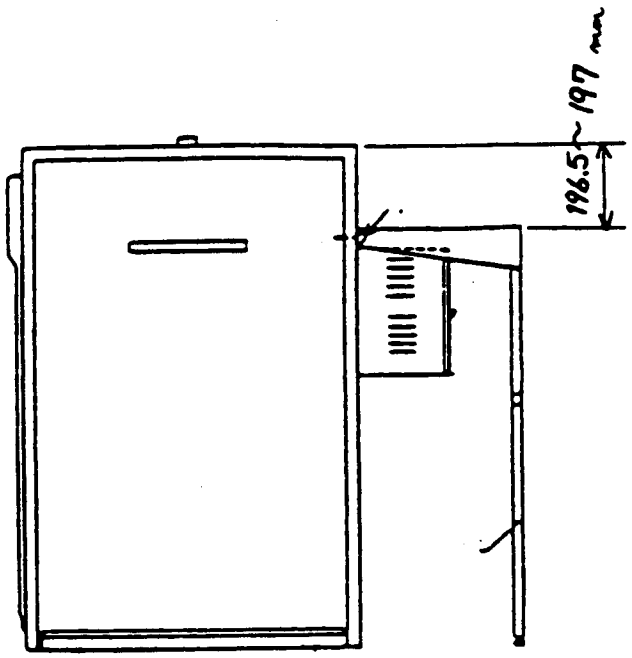


Fuji Auto-feeder IX Stand (optional)

Referring to the diagram below, assemble the stand, adjust the entrance roller and tray distance according to the procedures described in 4.

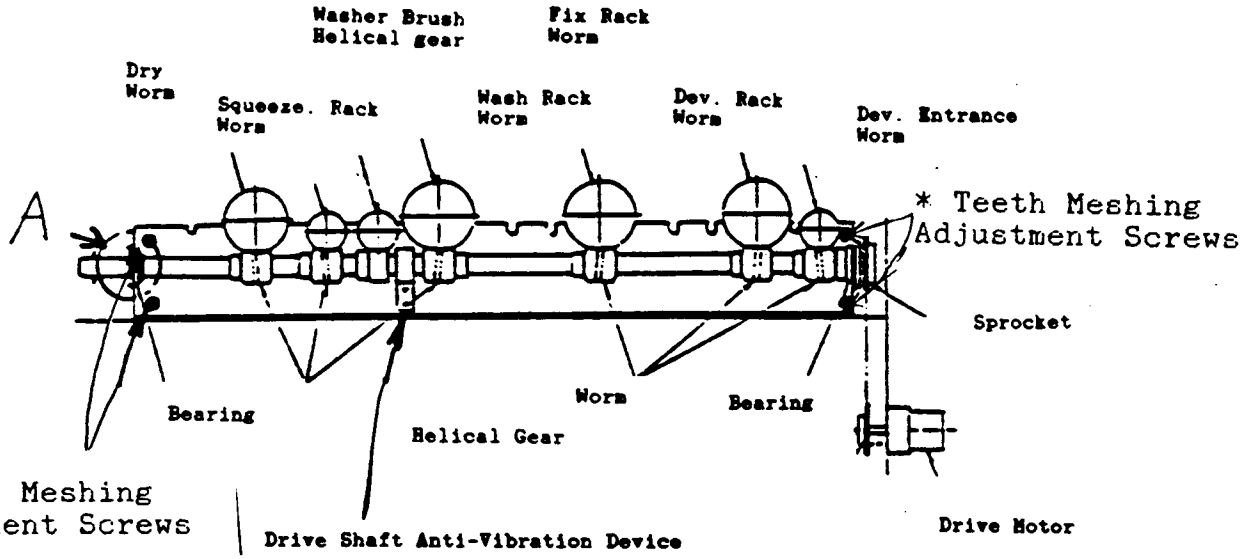


Auto-Feeder Stand Assembly Position



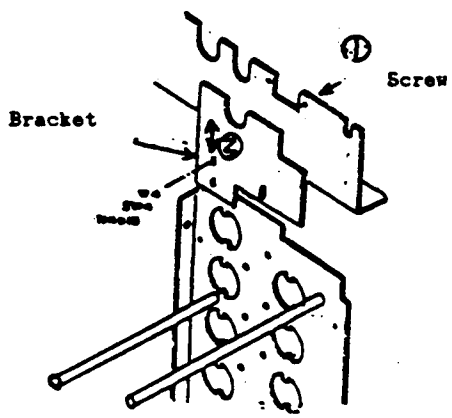
6. Drive

When teeth of gears are not correctly engaged, rack rollers do not rotate in a uniform manner, causing processing troubles.



6-1. Worm gears

- Loosen the vibration stop screw for the drive shaft, then adjust engagements by using screws with * mark in the diagram above.
- First using screws (1) adjust meshing amount. Second, pull up bracket (b) and secure position by tightening up screw (2).
- Tighten the vibration stop screw securely.



6-2. Drive shaft thrusting direction play

Referring to the diagram below, adjust the play from 0.5 to 1mm while the shaft is pushed all the way in arrow direction.