

Pneumatic Hand Tufting Gun: ZQ-III

OPERATOR'S MANUAL

ANKE INDUSTRIAL LIMITED CO., LTD

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I . Introduction

ZQ-III PNEUMATIC HAND TUFTING GUN is a manual and light tufting machine. With the corresponding exchange kit you can produce cut pile heights from 16 ~ 70 mm. With J-tuft up to 70 mm can be reached.

This **Hand Tufting Gun** is only created by DAYANG CARPET MACHINERY FACTORY CO., LTD. It's easy for adjustment and operation , long life and low failure.

II . Main Technical Datas And Using Range

Type	ZQ-III	Stitch Speed	0-1100 time/min (Adjustable)
Power	220V/50-60 HZ	Pile Height	Normal:18-40mm Upper :45-70mm
Power Supply	240W	Weight	3 kg
Motor Rate	0-2700 R.P.M	Air Supply	≥6 bar 200L/min

III. Mechanical Construction

Mechanical Construction drawing and spare parts list are shown on page 11,13 & 14. ZQ-III PNEUMATIC HAND TUFTING GUN consists of yarn feeding, drive, cut pile and stitching parts, etc.

IV. Preparation Before Working

(i) Frame

The most handtufting work is done on vertical frames, which will be made by yourselves . The frame consists of 4 bars (wood or steel) with nailboards, on which the primary backing can be stretched quickly and hard. The hight tension of the backing is very important and can be achieved with some practice. The types of frame construction are different , but all kids of the frame must be sure : the primary backing can be stretched hard and steady . A frame construction is as fig. 1 . The ready tufted and glued carpet is rolled on the upper roll.

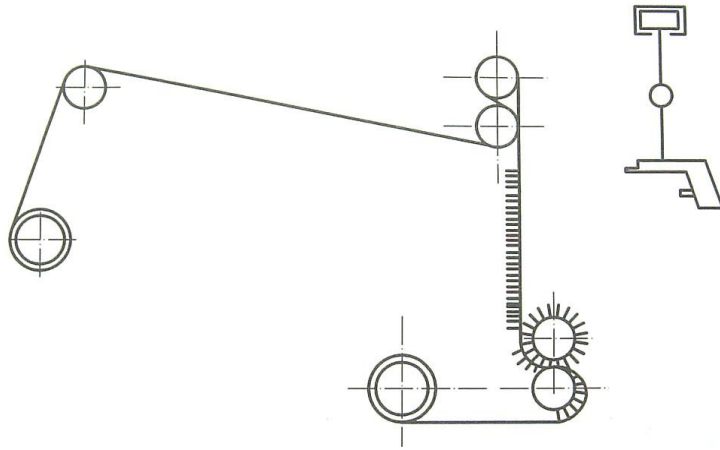


Fig. 1

(ii) The Construction of The Simple Frame (as Fig.2 & Fig.3)

1= Hand Tufting Gun

4= Frame

7=Rail

10=Rail connection

13= Screw

2=Spring-hook

5= Nailboards

8=Rail holder

11=Trolley

3=Balancer

6=Yarn set

9=trolley

12=Rail holder

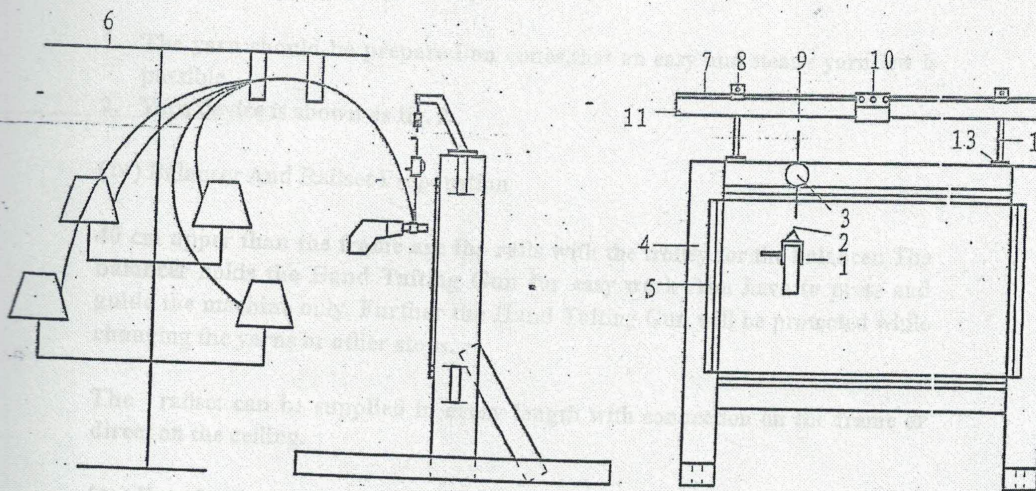


Fig 2

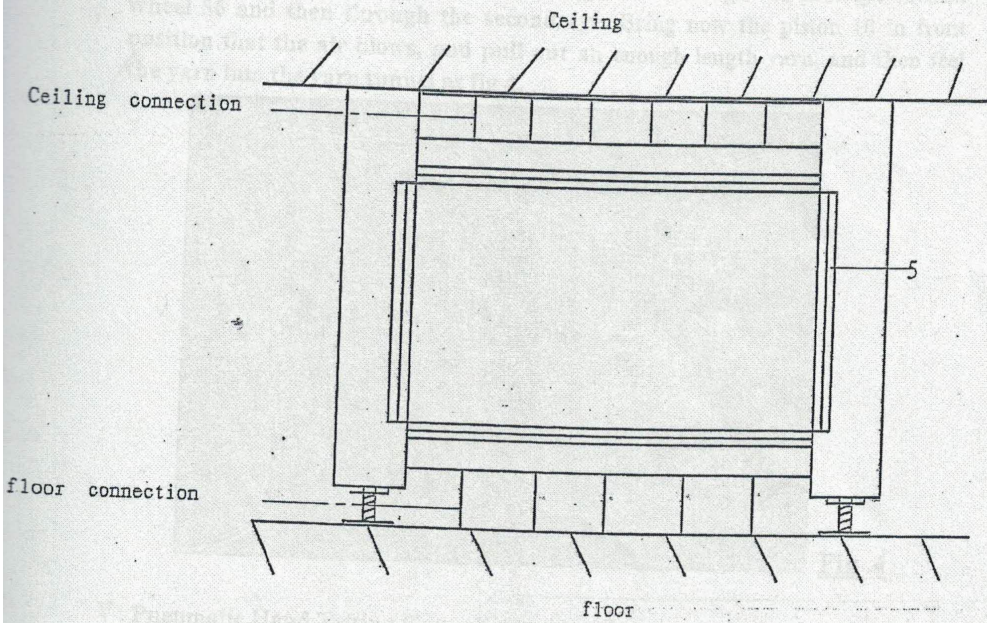


Fig 3

(iii) Yarn And Yarn Set Preparation

1. The yarn should be prepared on cones, that an easy and steady yarnflow is possible.
2. Yarn device is shown as fig. 2

(iv) Balancer And Railset Preparation

40 cm upper than the frame are the rails with the trolley for the balancer. The balancer holds the **Hand Tufting Gun** for easy work .You have to press and guide the machine only. Further the **Hand Tufting Gun** will be protected while changing the yarns or other stops.

The railset can be supplied in every length with connection on the frame or direct on the ceiling.

(v) Yarn feeding

The yarn should be prepared on cones, that an easy and steady yarnflow is possible. Feed the yarn as shown at the picture through the first eye to feed wheel 56 and then through the second eye. Bring now the piston 10 in front position that the air blows, and pull out an enough length yarn, and then feel the yarn into the yarn tunnel as fig 4.

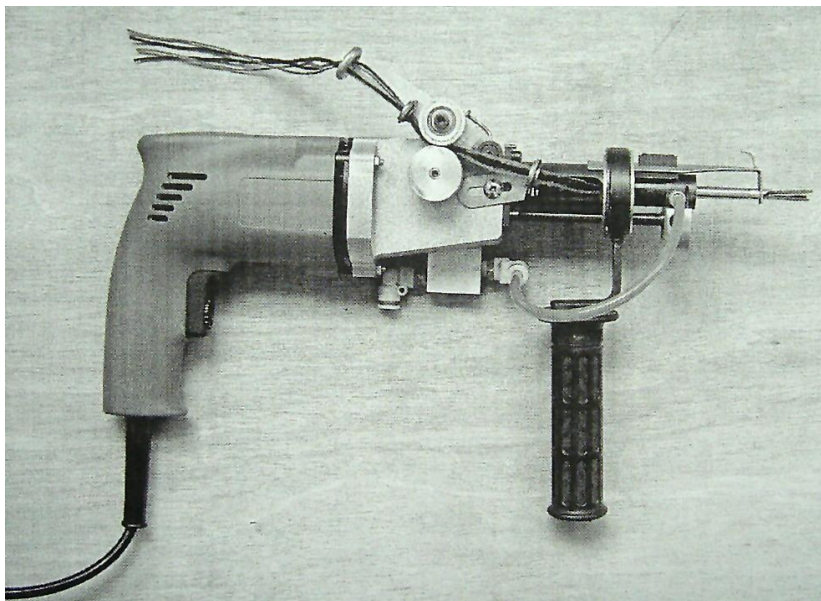


Fig .4

V. Pneumatic **Hand Tufting Gun** adjustment

(i) Blade Position

First, piston 10 must be posited in behind position.

The position of the blade 33 has to be as shown fig. 5. The position of the blade 33 can be changed as described in chapter VII (Page 6) to correct small differences in the pile height .

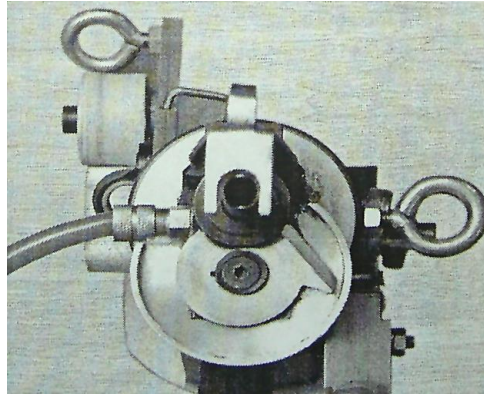


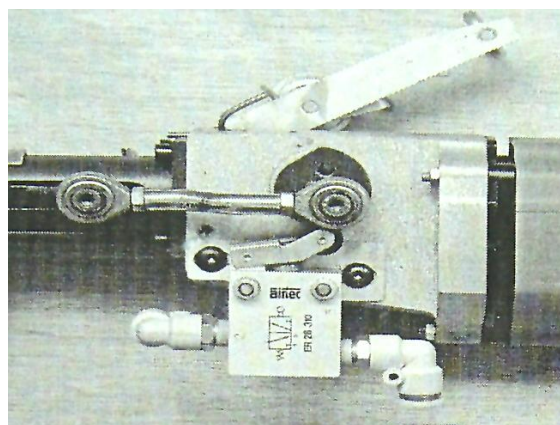
Fig. 5

(ii) Adjustment of Valve 29

The air has to blow when the piston 10 is in front position . The air is not allowed to blow, when the gun cuts and also when the piston 10 is on behind position.

The adjustment can be done by opening the screws M5×8 of the valve plate 28. The valve can be moved within the holes. (as shown fig. 6)

Fig. 6

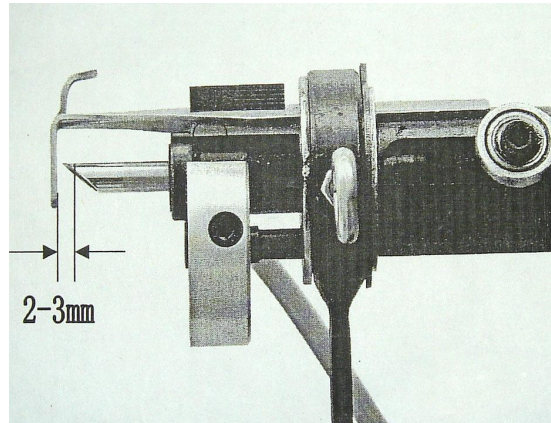


(iii) Adjustment of Guide Element 14

Fig. 7

The guide element 14 has to be the top of the needle 22 is behind the front line of the guide piston 10 is in behind position.

The correct position as fig.7:When the behind position, the distance between needle 22 and the guide element 14 is Attention ! By using pile height 65 mm check the position of guide element 14 position of piston 10, that the guide not be bent.



adjusted that disappointed element if the piston 10 is in the top of the 2-3mm. and 70 mm, also in front element will

Adjustment may as following :release screw for 15 (M5 × 10). Move guide element 14. And then, retighten screw M5 × 10.

VI. Start

- (i) needle / piston (22/10) in front position.
- (ii) press the switch on the **Hand Tufting Gun** (beginning with a low speed – can be controlled with the wheel + / - on the switch)

VII. Adjustment of blade 33

During working , yarn blows back (yarn cann't be fed), the **Hand Tufting Gun** must be stoped , to adjust blade 33.

The adjustment of the blade can be done with 2 methods:

(i) Blade adjustment – simple adjustment steps :

1. Disconnect plug from the main .
2. Piston 10 in behind position and check position of blade.
3. Remove plunger screw M5 × 18 and guide element 14, guide wedge 9.
4. Pull piston 10 in front , that the blade shaft is without gear connection.
5. Turn blade in wished position.
6. Connect piston / blade shaft with gear and fix connection rod screw M5 × 18 . Guide wedge 9.
7. Adjust guide element 14.
8. Check and adjust valve.
9. Turn the **Hand Tufting Gun** 1 time by hand to prove the machines movement.

(ii) Adjustment of blade in finer steps :

1. Disconnect plug from the main.
2. Piston 10 in behind position and check position of blade.
3. Remove screw M5×20 from cam 61. Take care that connection rod 62 will not be damaged.
4. Remove fixing screw M5×8 from cam 61. You need more power for opening the screw, it is glued.
5. Pull of cam 61 from axle 59 ; adjust 1 tooth different, push on axle again.
6. Tighten cam 61 with fixing screw M5×8 again.
7. Connect connection rod 62 to cam 61 with screw M5×20.
8. Check adjustment of valve 29.
9. If necessary , glue fixing screw again.
10. Turn the **Hand Tufting Gun** 1 time by hand to prove the machines movement.

VIII. Changing Parts

(i) Changing Feed Wheel

Pull the feed wheel from the axle and put the new one on this axle. (No screw)

(ii) Changing of needle

1. Disconnect the plug from the main.
2. Remove guide element 14.
3. Piston 10 / connection rod 62 in front position.
4. Remove needle ring 23 with special wrench and change needle.
5. Set in new needle 22 , top of needle and top of guide element 14 in same direction.
6. Fix needle ring 23 again and adjust guide element 14.

(iii) Changing of Blade 33

1. Disconnect the plug from the main.
2. Remove guide element 14 and needle 22.
3. Remove blade screw M4×16 (hold screw M5×20 with tool while opening screw)
4. Remove blade ring 32.
5. Push anvil 13 soft down with the end of a wooden bar and pull out the blade.
6. Remove blade from old blade and press into new blade.
7. Rebuild in reverse sequence.
8. check and adjust blade 33.
9. Turn the **Hand Tufting Gun** 1 time by hand, wether the machine movement is guaranteed.

IX. Maintenance To Pneumatic Hand Tufting Gun

- (i) Grinding of all movable parts of the machine every 0.5 hours or when necessary (sound of machine is changing, machine works hard). Use a normal car oil. Cleaning of machine from dirt and wooldust.
- (ii) Check the screws M5×18, M5×20 regularly for tightness.
- (iii) The gearbox should be greased every 1000 working hours.
- (iv) For Pneumatic Hand Tufting Gun , each 300 hours work must check the wear of the brushes. In order to avoid the blocking up of them into the brush – bolders or damaging the commutator. Owing to excess of consumption. It is suggested to change the brushes when their length becomes 1/3 of the original length.

Replacement of the brushes will be made with original spares. In this occasion, make sure the commutator surfaces are not grooved .If necessary, grind the sliding surface of the commutator in order to obtain a perfect commutation and a longer life of the engine. Keep the drive clean and free from oil. Take care that the slots for cooling the drive are free of yarn dust.

X. Clearing Failure

Failure	Checking	Clearing
Yarn blows back. Yarn can't be fed.	<ul style="list-style-type: none"> a) adjustment of blade b) adjustment of airblow c) guide tube is worn out d) stretching of primary backing 	P 6+7 chapter VII P 5 chapter V (ii) Replace Very hard
Yarn not cut	<ul style="list-style-type: none"> a) sharpness of blade / anvil b) drop of oil to blade (film blade / anvil) c) anvil touches blade d) bearing of blade shaft e) tension spring 11 strong enough 	Replace P7 Chapter VIII (iii) Replace spring 11 Replace Replace
Uneven pile heights a. regular differences b. irregular differences	<ul style="list-style-type: none"> a. correct feed wheel + needle b. adjustment guide element <ul style="list-style-type: none"> a. pressure tension wheel 47 to feed wheel 56 b. yarn flow is easily c. yarn tunnel free of dirt d. yarn contacted parts free of dirt e. blade screw M4×16 tighten f. driver disc 34 tighten 	P 6 Chapter V (iii)
Air blows steady	valve	replace
Yarn burst open	reduce air pressure	
Hand Tufting Machine squeals	maintenance to machine	P7 chapter IX

XI. About Different Pile Heights

Following pile heights can be produced together with the exchange kit. (see Page 12)

A. U-Tuft-Both piles same length.

You have to change feed wheel 56 together with the needle 22. – about 2 minutes.

Attention!! After you change feed wheel and needle, you have to adjust guide element 14. (Please see

Page 6 (iii) Adjustment of Guide Element 14.)

Pile height equals

- 18 mm
- 20 mm
- 25 mm
- 30 mm
- 35 mm
- 40 mm
- 45 mm

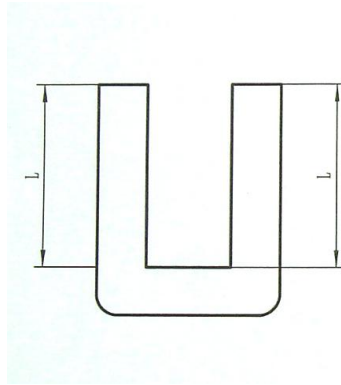


Fig. 8

B. J-Tuft-Unequal pile length

You have to change only feed wheel 56 –possible use for fringing.

Attention!! After you change feed wheel 56, you have to adjust guide element 14. (Please see Page 6 (iii) Adjustment of Guide Element 14.)

Pile height unequal

- a. 18 mm b. 65 mm
- a. 18 mm b. 55 mm
- a. 18 mm b. 45 mm
- a. 18 mm b. 35 mm
- a. 18 mm b. 25 mm
- a. 18 mm b. 20 mm
- a. 18 mm b. 70 mm

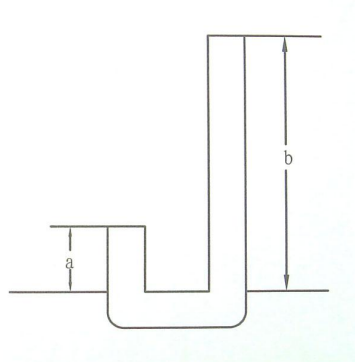


Fig.9

These mentioned possibilities are valid for yarn tunnel 6mm. For yarn tunnel 4 and 5 mm needles are available from 16 to 25 mm.

XII: Sharpening Tool For Blade 33.

1. Fix the blade repaired with screw on sharpening tool

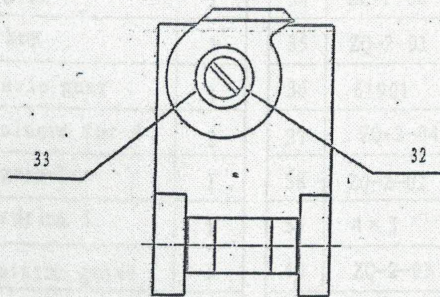


Fig. 10

2. Sharp blade with sharpening tool on oil stone

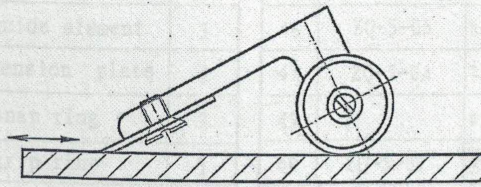


Fig. 11

3. Remove edge from blade

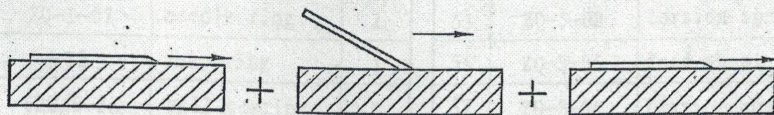


Fig. 12

4. strop blade in a piece of wood.

ZQ-III. HANDTUFTING GUN PARTS NUBER TABLE

NO.	PARTS NUBER	PARTS NAME	NUBER	NO.	PARTS NUBER	PSRTD NAME	NUBER
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1		MOTOR	1	33	ZQ-2-07	BLADE	1
2	ZQ-0-02	GEAR	1	34	ZQ-2-06	DRIVER DISC	1
3	3*3	KEY	1	35	ZQ-2-01	BLADE SHAFT	1
4	ZQ-0-01	AXLE GEAR	1	36	61910	BALL BEARING	2
5	ZQ-0-03	SLEEVE FOR 4	1	37	ZQ-2-04	WASHER FOR 36, 41	1
6	ZQ-0-04	GEAR-BOX	1	38	ZQ-2-02	GEAR	1
7	ZQ-1-10	SPRING 1	1	39	4*3	KEY	2
8	ZQ-1-04	PISTON GUIDE	1	40	ZQ-2-03	MAIN AXLE	1
9	ZQ-1-06	GUIDE WEDGE	1	41	6001	BALL BEARING	1
10	ZQ-1-05	PISTON	1	42	ZQ-2-05	GEAR	1
11	ZQ-1-13	TENSION SPRING	1	43	∅ 12	SNAP RING	1
12	ZQ-1-09	GUIDE TUBE	1	44	625/-2Z	BALL BEARING	2
13	ZQ-1-08	ANVIL	1	45	ZQ-5-04	BEARING HOUSING	2
14	ZQ-1-02	GUIDE ELEMENT	1	46	ZQ-5-05	SLEEVE FOR 44	1
15	ZQ-1-03	TENSION PLATE	1	47	∅ 12	TENSION WHEEL	1
16	∅ 42	SNAP RING	1	48		WASHER (∅ 5)	2
17	ZQ-4-04	GRIP RING	1	49	ZQ-5-01	YARN GUIDE RING	1
18	ZQ-4-05	RUNNER RING	1	50	ZQ-5-06	WASHER	1
19	ZQ-4-01	HANDLE ROD	1	51	ZQ-5-02	LEVER ARM	1
20	ZQ-4-02	RUBBER HANDLE	1	52	ZQ-5-11	YARN GUIDE BUSH	1
21	ZQ-4-03	HANDLE TUBE	1	53	ZQ-5-09	YARN GUIDE ARM	1
22	ZQ-1-01	NEEDLE	1	54	ZQ-5-07	BUSH FOR 51	1
23	ZQ-1-07	NEEDLE RING	1	55	ZQ-5-08	TORSION SPRING	1
24	∅ 13	SNAP RING	1	56	ZQ-3-05	FEED WHEEL	1
25	682/6-2Z	BALL BEARING	1	57	ZQ-3-04	BEARING HOUSING	1
26	ZQ-1-12	BLADE GUARD	1	58	608	BALL BEARING	2
27	ZQ-1-11	PLUNGER	1	59	ZQ-3-02	AXLE	1
28	ZQ-0-06	VALVE PLATE	1	60	∅ 2*16	PIN	1
29		VALVE	1	61	ZQ-3-01	CAM	1
30	∅ 6	TUBE DIA 6 mm		62	ZQ-3-07	CONNECTION ROD	1
31		SCREWED JOINT	2	63	ZQ-5-13	ADJUSTABLE VARN GUIDE ARM	1
32	ZQ-2-08	BLADE RING	1	64	ZQ-5-12	YARN GUIDE BUSH	1

XIV. The Relationship between pile Height and Needle 22 Length and Yarn Feed Wheel 56 Dia. Table:

Normal pile height:

pile height (mm)	40	35	30	25	20	18
needle (22) length (mm)						
feed (56) wheel dia. (mm)	φ 27	φ 23.9	φ 20.7	φ 17.5	φ 14.3	φ 13.

Upper pile height:

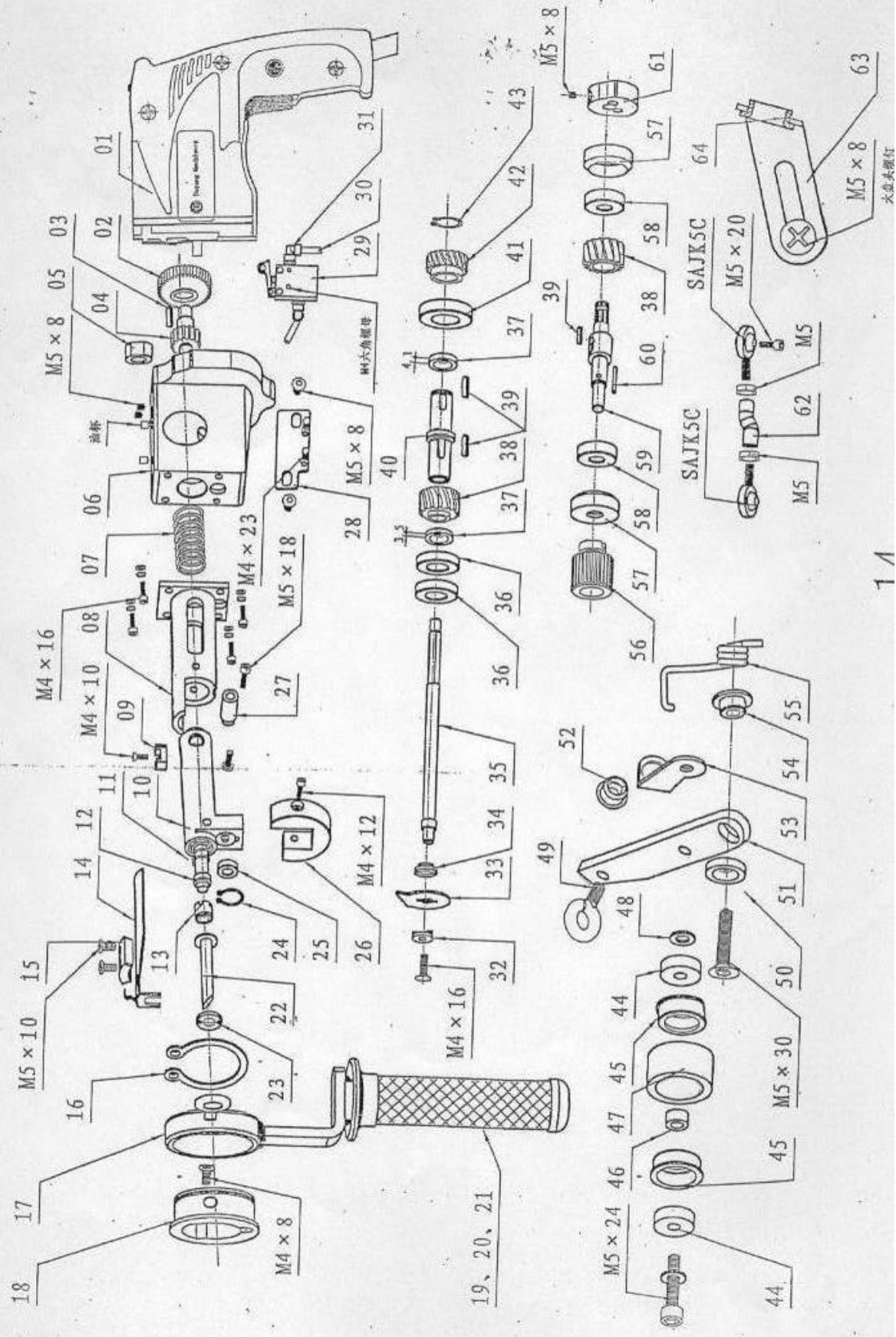
pile height (mm)	70	65	60	55	50	45
needle length (mm)						
feed wheel dia. (mm)	φ 47.1	φ 43.5	φ 40.1	φ 37.1	φ 34.5	φ 30.1

For example 1: You want produce that pile height equal 20mm (U-Tuft-Both piles same length). you must have to change needle (22) (its length equal 23.5mm as table) and feed wheel (56) (its dia. equal φ 14.3mm. as table)

For example 2: You want produce that j-Tuft for fringing: pile height a equal 18mm, b equal 35 mm. (as Fig. 9). you must have to change feed wheel 56 (its dia. equal φ 23.9mm . as table) and needle (its length equal 21.5mm as table). when you need produce pile height a equal 18mm, b be equal 70 mm, you must have to change only feed wheel 56 (its dia. equal φ 47.1mm . as table)

气动织枪结构图

ZQ-III HANDTUFTING GUN PARTS



XVI. Handtufting Gun Spare Table:

No:	Parts name	Parts nuber	nuber	No	Parts name	Parts size	nuber
1	needle	ZQ-1-01	5	19	tool for nut	7×8	1
2	feed wheel	ZQ-3-05	5	20	tool for nut	12	1
3	valve		1	21	tool for snap ring	150	1
4	anvil	ZQ-1-08	1	22	wood bar	tool for 13	2
5	blade	ZQ-2-07	2	23	tool	tool for 34	1
6	air filter		1 set				
7	bearing (SAJK5C)		2				
8	connection rod	ZQ-3-07	1				
9	guide wedge	ZQ-1-06	1				
10	spring for 51	ZQ-5-08	1				
11	tension spring	ZQ-1-13	1				
12	screw	M5 × 18	4				
13	screw	M5 × 10	2				
14	screw	M4 × 10	2				
15	screw	M5 × 10	2				
16	screw	M5 × 16	4				
17	pin screw	M5 × 8	2				
18	tool for nut	2.5, 3, 4	1 set				