



BS - 472

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BS - 473

**HIGH SPEED SINGLE THREAD CHAINSTITCH
BUTTON SEWER**

INSTRUCTION MANUAL SPARE PARTS LIST

Global International BV

H. Figeeweg 4
2031 BJ Haarlem
tel: 023-5319584
fax: 023-5311022
e-mail: global@imca.net

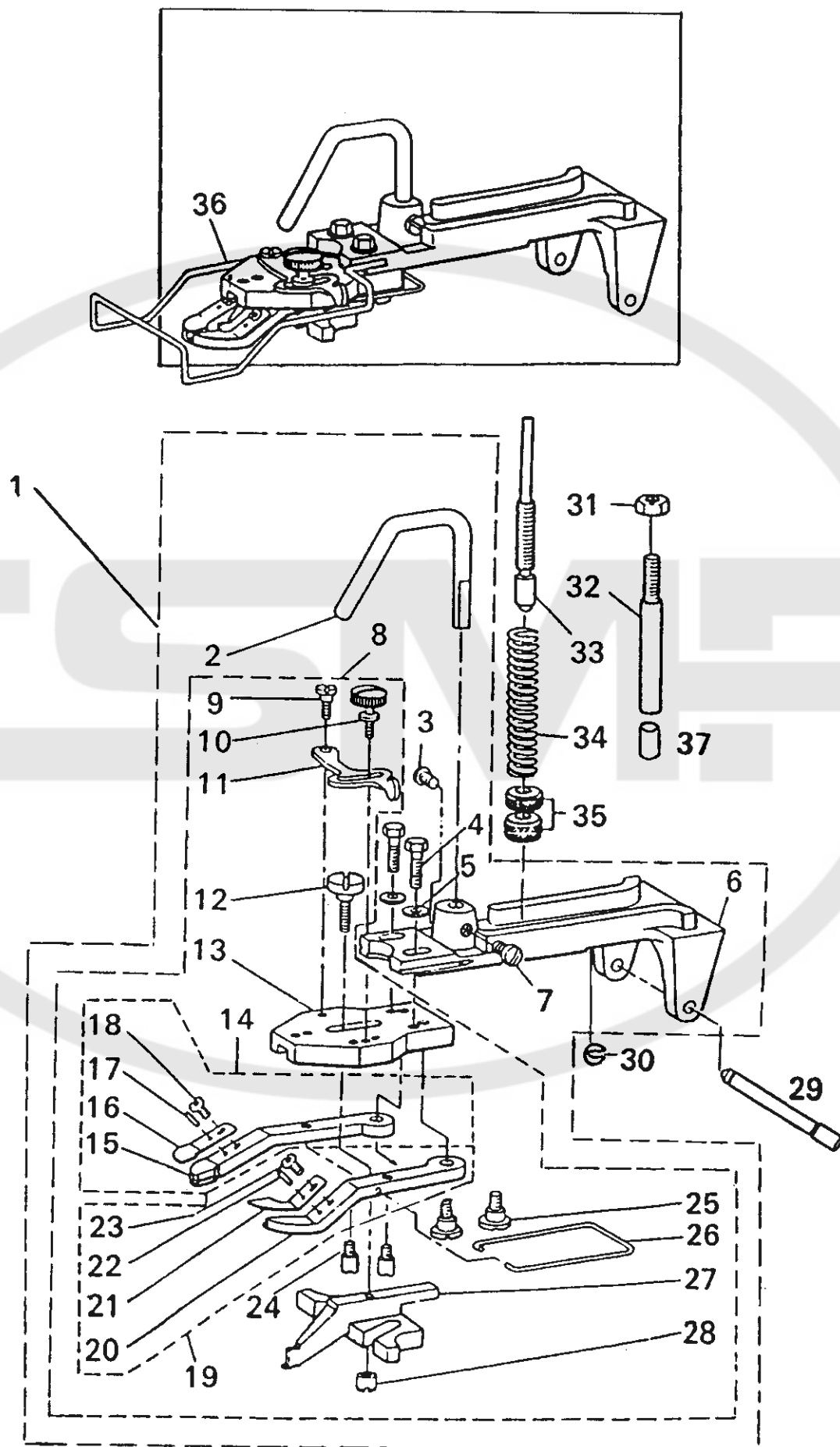
Global Parts bv

H. Figeeweg 4B
2031 BJ Haarlem
tel: 023-5425312
fax: 023-5423422
e-mail: globalparts@planet.nl

CONTENTS

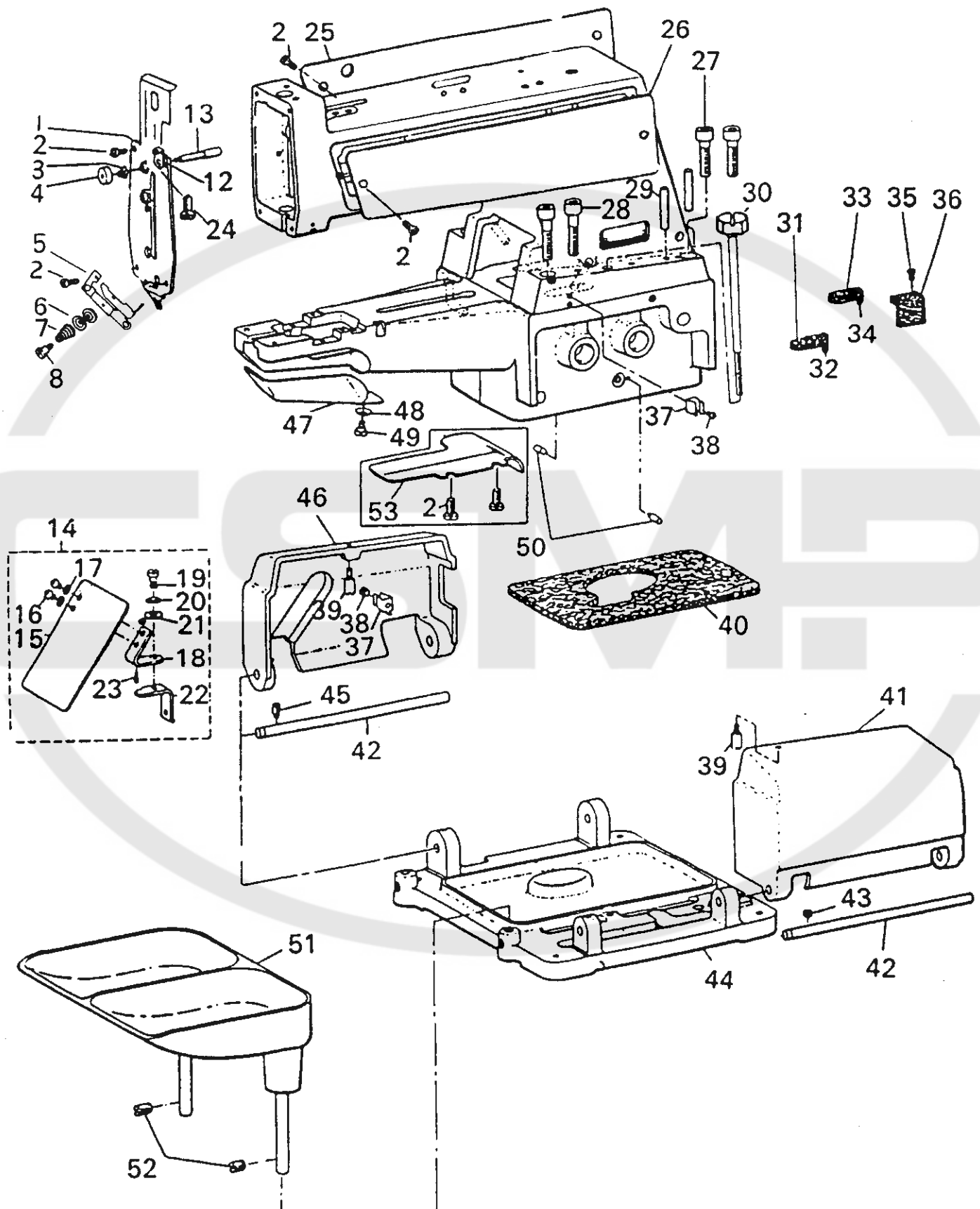
1. **BUTTON CLAMP MECHANISM COMPONENTS**
2. **MACHINE ARM & MISCELLANEOUS COVERS COMPONENTS**
3. **LOOPER SHAFT MECHANISM COMPONENTS**
4. **NIPPER & THREAD HANDLING PARTS COMPONENTS**
5. **FEED PLATE COMPONENTS**
6. **BUTTON CLAMP LIFTER COMPONENTS**
7. **NEEDLE DRIVING PULLEY SHAFT MECHANISM COMPONENTS**
8. **NEEDLE BAR DRIVING MECHANISM COMPONENTS**
9. **STOP MOTION MECHANISM COMPONENTS**
10. **STITCH SELECTING PARTS COMPONENTS**

1. BUTTON CLAMP MECHANISM COMPONENTS



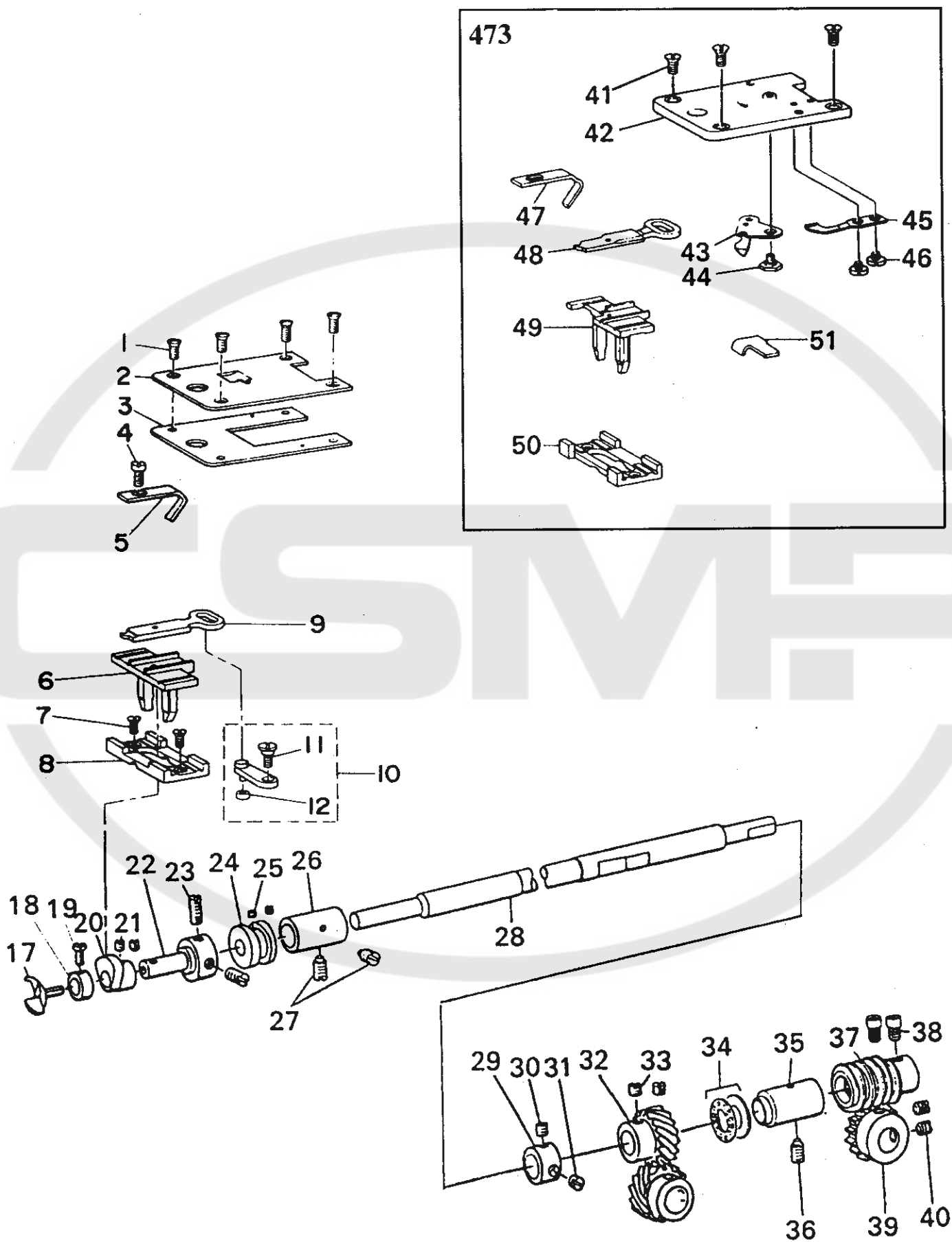
	Part No.	Description	Amt. Req.
1	B00101	FLAT BUTTON CLAMP ASM.	1
2	B00102	BUTTON CLAMP LIFTING ROD	1
3	B00103	SCREW 15/64-28 L=9	1
4	B00104	SCREW 3/16-32 L=13.5	2
5	B00105	WASHER	2
6	B00106	BUTTON CLAMP HOLDER	1
7	B00107	SCREW 15/64-28 L=9	1
8	B00108	JAWLEVER HOLDER ASM.	1
9	B00109	HINGE SCREW D=5.5 H=1.8	1
10	B00110	CLAMP SCREW	1
11	B00111	SNAP FASTENER CLAMP	1
12	B00112	HINGE SCREW D=5.5 H=3	1
13	B00113	JAW LEVER HOLDER	1
14	B00114	BUTTON CLAMP LEVER JAW, LEFT ASM.	1
15	B00115	BUTTON CLAMP LEVER JAW, LEFT	1
16	B00116	BUTTON HOLDING SPRING, LEFT	1
17	B00117	BUTTON CLAMP LOCATING PIN	1
18	B00118	SCREW 9/64-40 L=3.5	1
19	B00119	BUTTON CLAMP LEVER JAW, RIGHT ASM.	1
20	B00120	BUTTON CLAMP JAW, RIGHT	1
21	B00121	BUTTON HOLDING SPRING, RIGHT	1
22	B00122	BUTTON CLAMP LOCATING PIN	1
23	B00123	SCREW 9/64-40 L=3.5	1
24	B00124	BUTTON CLAMP STOP PIN	2
25	B00125	HINGE SCREW D=6.35 H=3.9	2
26	B00126	BUTTON CLAMP SPRING	1
27	B00127	BUTTON CLAMP SLIDE	1
28	B00128	NUT	1
29	B00129	HINGE PIN	1
30	B00130	SNAP RING	1
31	B00131	NUT	1
32	B00132	BUTTON CLAMP STOPPER PIN	1
33	B00133	BUTTON CLAMP PRESSURE ADJUSTING BAR	1
34	B00134	PRESSURE ADJUSTING SPRING	1
35	B00135	THREAD TENSION STUD NUT	2
36	B00136	FINGER GUARD	1
37	B00137	SEAL PLUG	1

2. MACHINE ARM & MISCELLANEOUS COVERS COMPONENTS



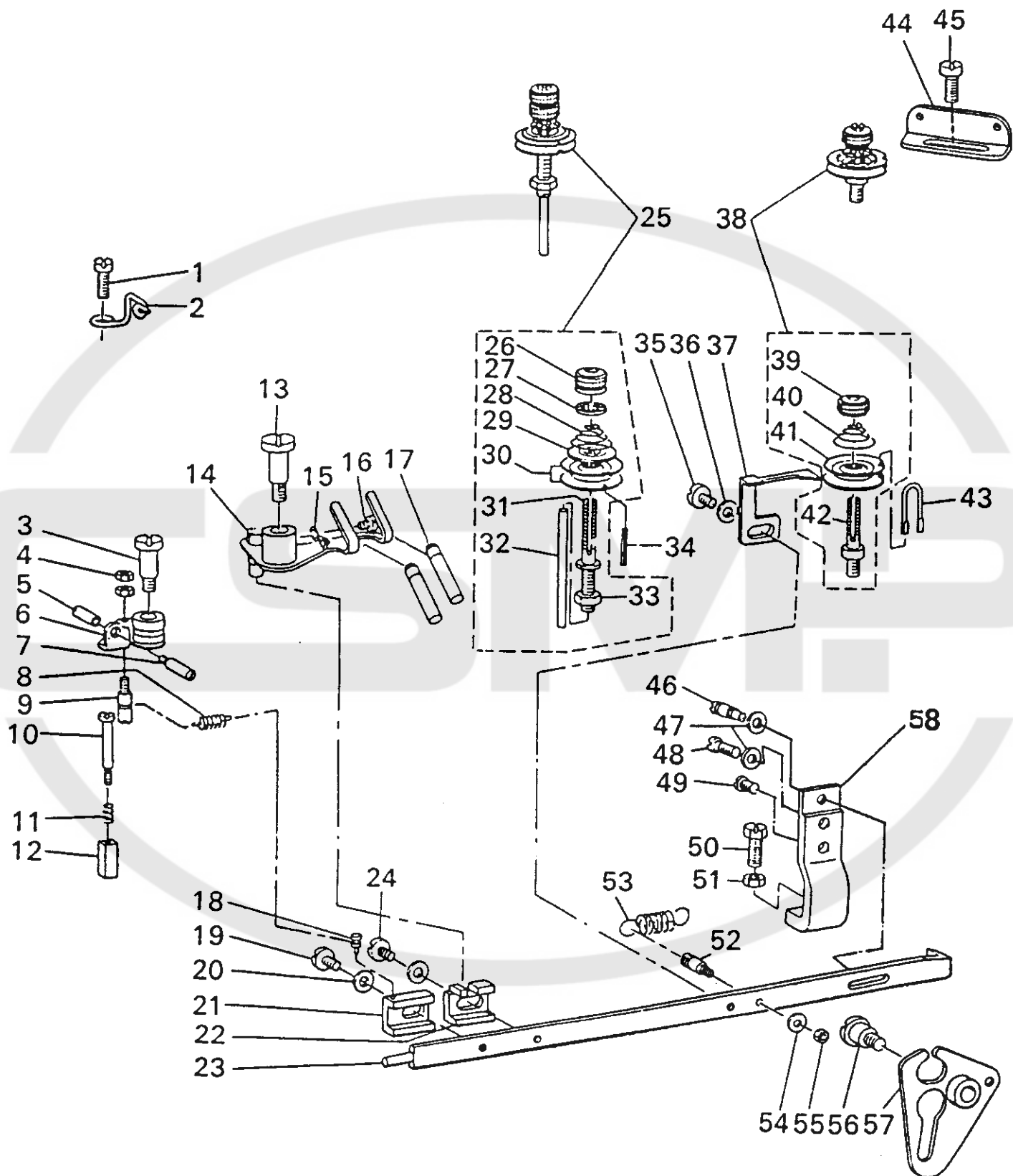
	Part No.	Description	Amt. Req.
1	B00201	FRONT COVER ASM.	1
2	B00202	SCREW 3/16-28 L=8	10
3	B00203	TENSION SPRING	1
4	B00204	NIPPER RELEASING PLUNGER THUMB NUT	1
5	B00205	THREAD TENSION GUIDE ASM.	1
6	B00206	TENSION DISC	2
7	B00207	TENSION SPRING	1
8	B00208	E-SHAPED SNAP RING	1
--	----	-----	0
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12	B00212	THREAD GUIDE	1
13	B00213	NIPPER RELEASING PLUNGER	1
14	B00214	SAFETY PLATE ASM.	1
15	B00215	SAFETY PLATE	1
16	B00216	SCREW 11/64-40 L=7	2
17	B00217	WASHER	2
18	B00218	SAFETY PLATE INSTALLING PLATE	1
19	B00219	HINGE SCREW D=6 H=4	1
20	B00220	DISC SPRING	1
21	B00221	WASHER	1
22	B00222	SAFETY PLATE MOUNTING BASE	1
23	B00223	SPRING PIN	1
24	B00224	SCREW	1
25	B00225	SIDE COVER, LEFT	1
26	B00226	SIDE COVER, RIGHT	1
27	B00227	SCREW M8 L=30	2
28	B00228	SCREW M8 L=35	2
29	B00229	GUIDE PIN	2
30	B00230	SET SCREW ASM.	1
31	B00231	OIL FELT, LARGE	1
32	B00232	OIL WICK	1
33	B00233	OIL FELT, SMALL	1
34	B00234	OIL WICK	1
35	B00235	SCREW 11/64-40 L=7.8	1
36	B00236	OIL SUPPLY FELT	1
37	B00237	SIDE COVER SPRING	2
38	B00238	SCREW 9/64-40 L=4.5	2
39	B00239	SCREW STUD	2
40	B00240	OIL DRIP FELT	1
41	B00241	SIDE COVER, RIGHT	1
42	B00242	SIDE COVER HINGER SHAFT	2
43	B00243	SCREW 15/64-28 L=4	1
44	B00244	MACHINE SUB-BASE	1
45	B00245	SCREW 15/64-28 L=10.5	1
46	B00246	SIDE COVER, LEFT	1
47	B00247	LOOPER COVER	1
48	B00248	SPRING WASHER	1
49	B00249	HINGE SCREW D=6 H=2.7	1
50	B00250	CAM INDICATING PIN	2
51	B00251	BUTTON TRAY ASM.	1
52	B00252	SCREW 15/64-28 L=7	2
53	B00253	SCREW 11/64-40 L=7.8	2

3. LOOPER SHAFT MECHANISM COMPONENTS



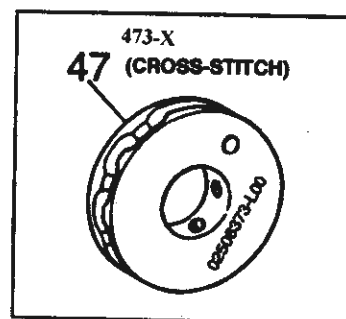
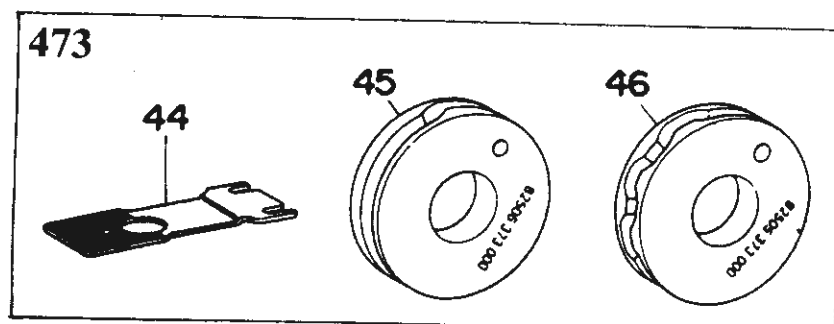
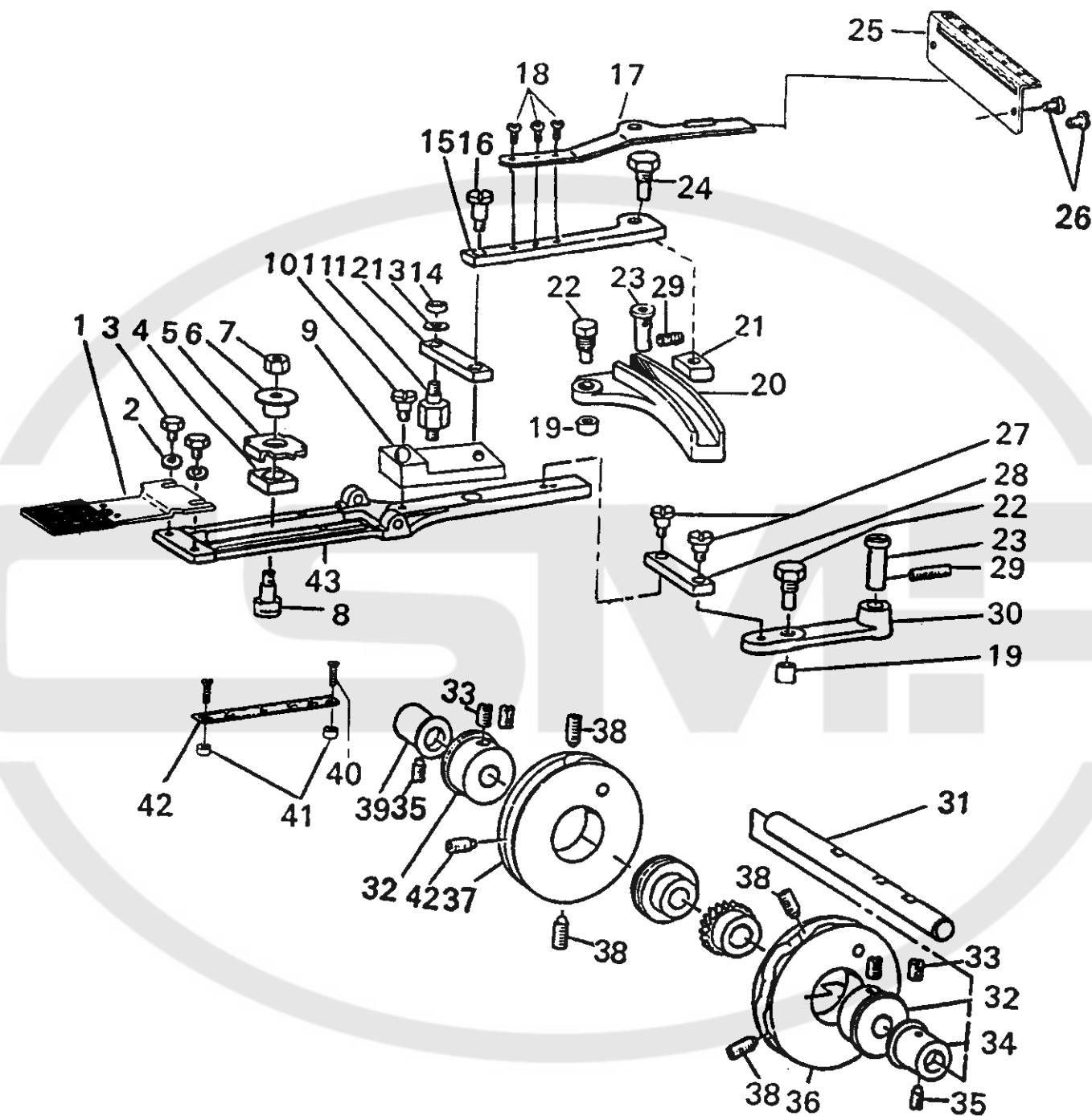
	Part No.	Description	Amt. Req.
1	B00301	SCREW 11/64-40 L=8.5	4
2	B00302	THROAT PLATE	1
3	B00303	SPACER PLATE	1
4	B00304	SCREW 11/64-40 L=7.8	1
5	B00305	NEEDLE GUARD	1
6	B00306	POSITIONING FINGER YOKE SLIDE	1
7	B00307	SCREW 11/64-40 L=7	2
8	B00308	YOKE SLIDE INSERT	1
9	B00309	YOKE SLIDE	1
10	B00310	LOOP POSITIONING FINGER LEVER	1
11	B00311	HINGE SCREW D=6.35 H=2.4	1
12	B00312	LOOPER POSITIONING FINGER LEVER ROLL	1
17	B00317	LOOPER	1
18	B00318	THRUST COLLAR	1
19	B00319	SCREW 9/64-40 L=6.1	1
20	B00320	LOOP POSITIONING FINGER CAM	1
21	B00321	SCREW 11/64-40 L=3.5	2
22	B00322	LOOPER & CAM SLEEVE	1
23	B00323	SCREW 15/64-28 L=4	2
24	B00324	LOOP POSITIONING FINGER	1
25	B00325	SCREW 11/64-40 L=2.8	2
26	B00326	LOOPER SHAFT BUSHING, FRONT	1
27	B00327	SCREW 15/64-28 L=10.5	2
28	B00328	LOOPER SHAFT	1
29	B00329	THRUST COLLAR	1
30	B00330	SCREW 1/4-40 L=5	1
31	B00331	SCREW 1/4-40 L=3	1
32	B00332	LOOPER SHAFT DRIVEN GEAR	1
33	B00333	SCREW 1/4-40 L=6	2
34	B00334	THRUST BALL BEARING	1
35	B00335	LOOPER SHAFT BUSHING, REAR	1
36	B00336	SCREW 15/64-28 L=10.5	1
37	B00337	DRIVEN WORM	1
38	B00338	SCREW 1/4-40 L=7	2
39	B00339	CAM SHAFT DRIVEN GEAR	1
40	B00340	SCREW 1/4-40 L=6	2
41	B00341	SCREW 11/64-40 L=8.5	3
42	B00342	THROAT PLATE	1
43	B00343	MOVING KNIFE	1
44	B00344	HINGE SCREW D=6 H=0.85	1
45	B00345	COUNTER KNIFE	1
46	B00346	SCREW 1/8-44 L=3	2
47	B00347	NEEDLE GUARD	1
48	B00348	YOKE SLIDE	1
49	B00349	POSITIONING FINGER YOKE SLIDE	1
50	B00350	YOKE SLIDE INSERT	1
51	B00351	GAUGE	1

4. NIPPER & THREAD HANDLING PARTS COMPONENTS



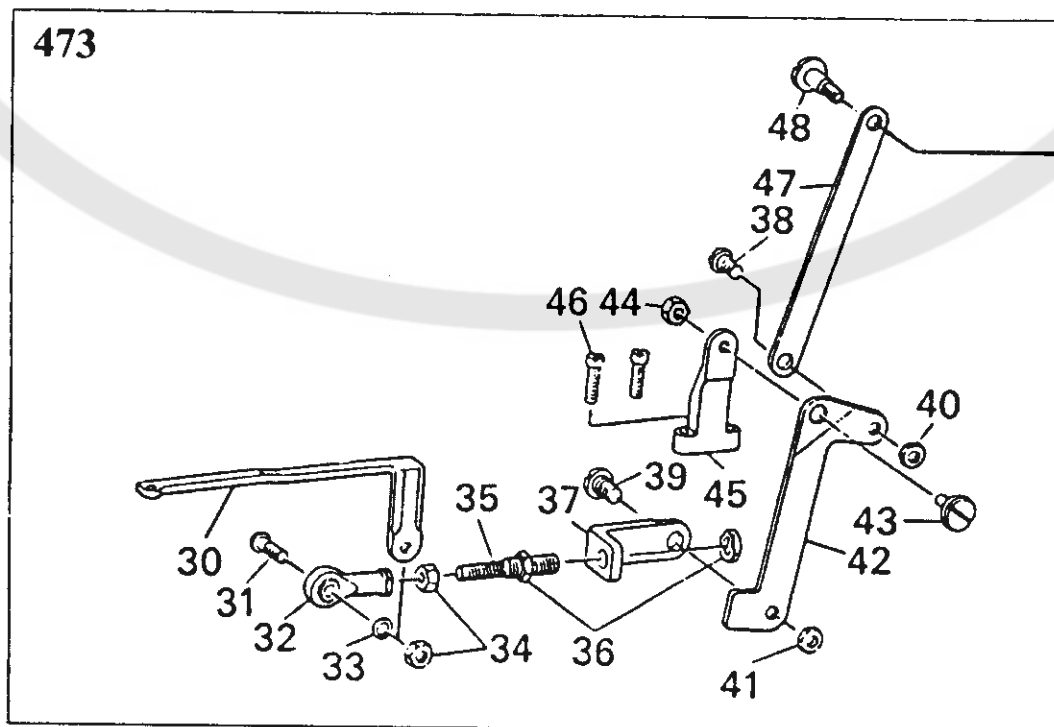
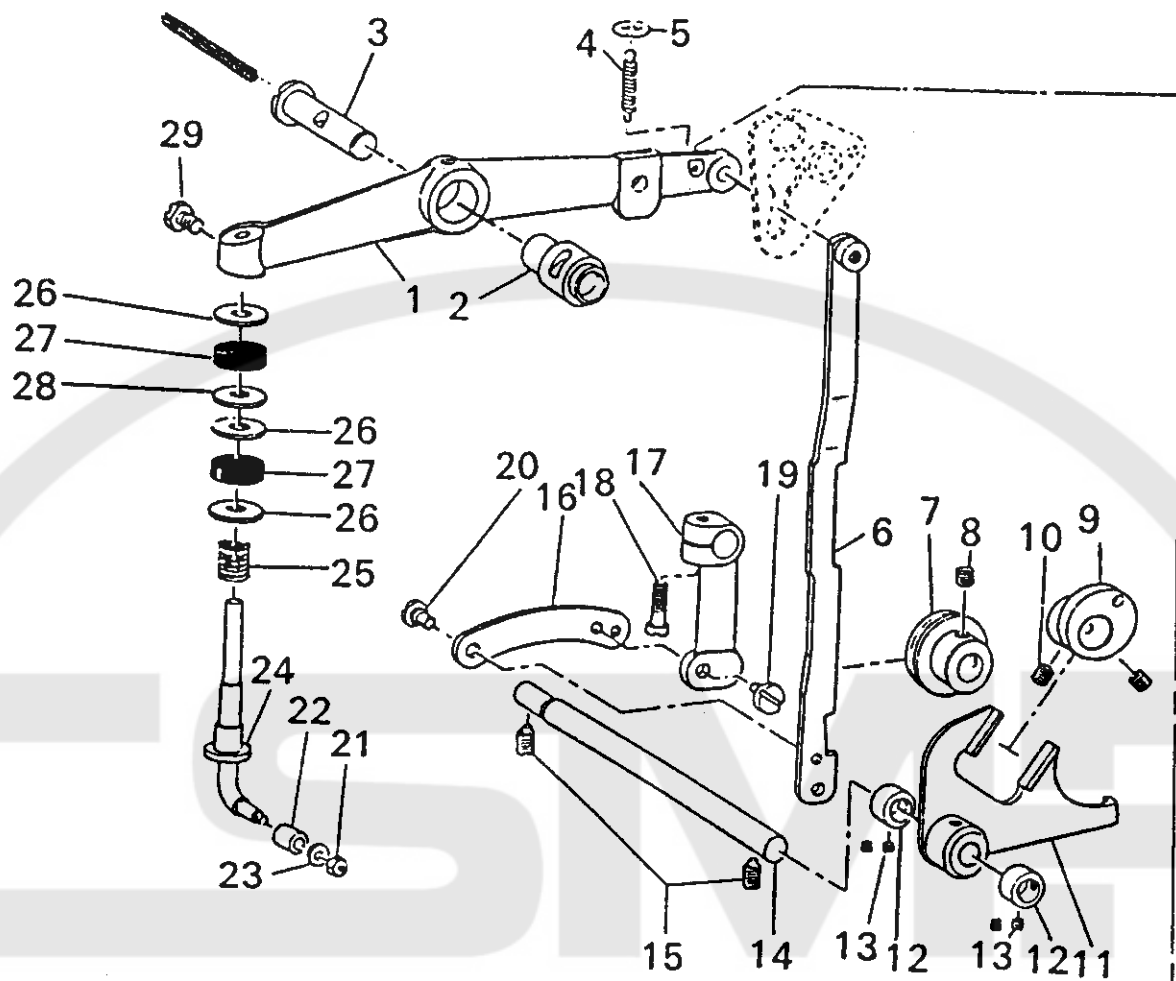
	Part No.	Description	Amt. Req.
1	B00401	SCREW 15/64-28 L=12	1
2	B00402	THREAD GUIDE	1
3	B00403	HINGE SCREW D=7.94 H=12.7	1
4	B00404	NUT	2
5	B00405	NUT	1
6	B00406	THREAD NIPPER	1
7	B00407	THREAD RELEASING SCREW STUD	1
8	B00408	NIPPER BAR BLOCK SPRING	1
9	B00409	NIPPER BAR BLOCK SPRING SCREW	1
10	B00410	SCREW D=4 H=20	1
11	B00411	NIPPER BLOCK SPRING	1
12	B00412	NIPPER BLOCK	1
13	B00413	HINGE SCREW D=7.94 H=15	1
14	B00414	THREAD PULL-OFF LEVER	1
15	B00415	THREAD GUIDE	1
16	B00416	SCREW 9/64-40 L=4.6	1
17	B00417	THREAD GUIDE	2
18	B00418	NIPPER BAR BLOCK SPRING PIN	1
19	B00419	SCREW 3/16-28 L=9	1
20	B00420	WASHER	2
21	B00421	NIPPER BAR BLOCK	1
22	B00422	NIPPER BAR BLOCK REAR	1
23	B00423	NIPPER BAR	1
24	B00424	SCREW 3/16-28 L=9	1
25	B00425	TENSION POST ASM.	1
26	B00426	TENSION NUT	1
27	B00427	TENSION DISC STOPPER	1
28	B00428	TENSION SPRING	1
29	B00429	TENSION DISC HOLDER	1
30	B00430	TENSION DISC	2
31	B00431	TENSION POST	1
32	B00432	TENSION RELEASE PIN	1
33	B00433	NUT	1
34	B00434	SPRING PIN	1
35	B00435	SCREW 3/16-28 L=9	1
36	B00436	WASHER	1
37	B00437	THREAD TENSION RELEASING LEVER	1
38	B00438	THREAD TENSION ASM.	1
39	B00439	THREAD TENSION STUD NUT	1
40	B00440	TENSION SPRING	1
41	B00441	TENSION DISC	2
42	B00442	THREAD TENSION STAFF	1
43	B00443	THREAD GUIDE	1
44	B00444	THREAD GUIDE	1
45	B00445	SCREW 15/64-28 L=12	1
46	B00446	ADJUSTING SCREW	1
47	B00447	WASHER	2
48	B00448	SCREW 3/16-28 L=15.5	1
49	B00449	SCREW 3/16-28 L=9.5	1
50	B00450	BOLT 15/64-28 L=14	1
51	B00451	NUT	1
52	B00452	NIPPER BAR SPRING SCREW	1
53	B00453	NIPPER BAR SPRING	1
54	B00454	WASHER	1
55	B00455	NUT	1
56	B00456	HINGE SCREW D=7.94 H=8	1
57	B00457	NIPPER BAR ACTUATING LEVER	1
58	B00458	NIPPER BAR BEARING BLOCK	1

5. FEED PLATE COMPONENTS



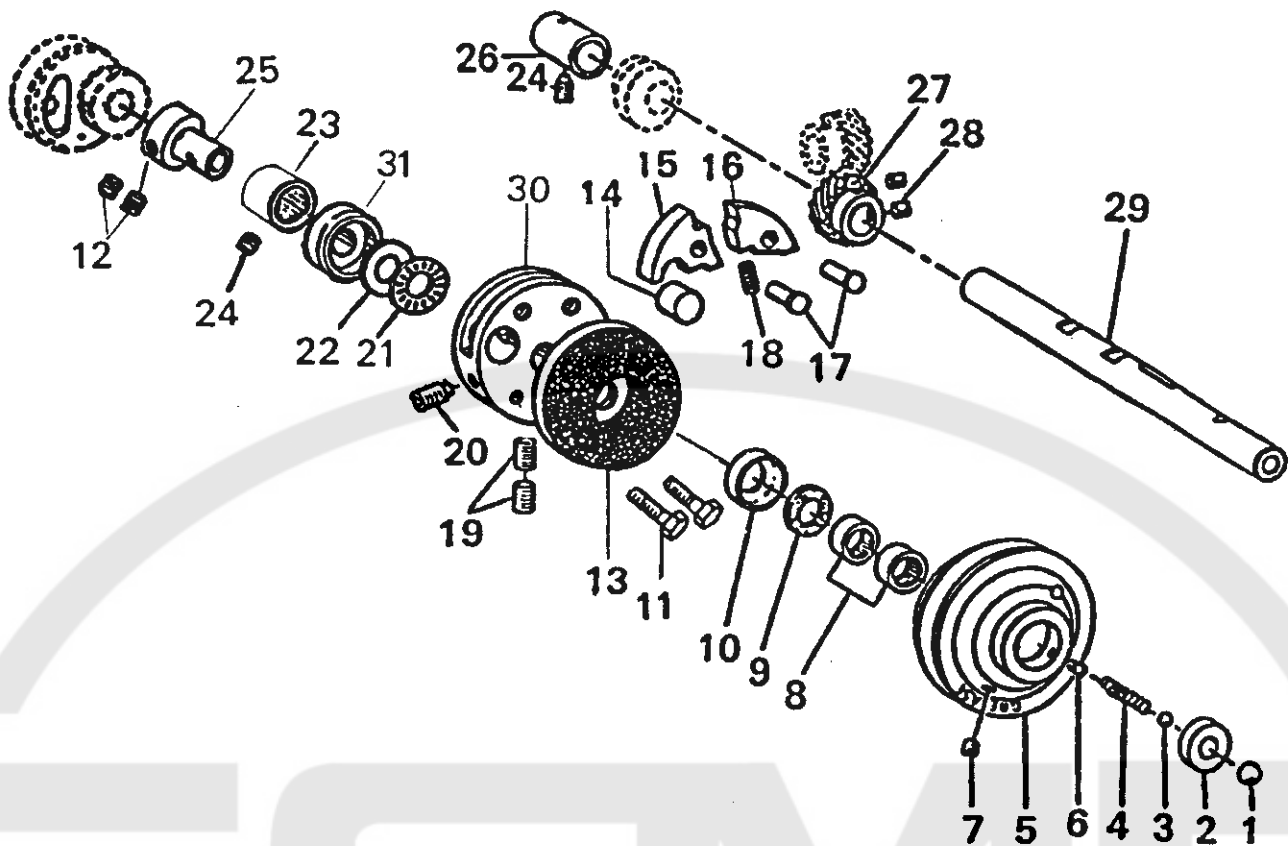
	Part No.	Description	Amt. Req.
1	B00501	FEED PLATE	1
2	B00502	WASHER	1
3	B00503	SCREW 3/16-28 L=6	2
4	B00504	INDICATOR PIN BEARING BLOCK	1
5	B00505	CROSSWISE FEED INDICATOR	1
6	B00506	CROSSWISE FEED INDICATOR PIN	1
7	B00507	NUT	1
8	B00508	HINGE SCREW FOR CROSSWISE FEED	1
9	B00509	SLIDE PLATE CONNECTING LINK	1
10	B00510	HINGE SCREW D=6.35 H=4.8	1
11	B00511	STUD M6-1.0 D=8.0	1
12	B00512	INTERMEDI CONNECTING LINK	1
13	B00513	WASHER	1
14	B00514	NUT	1
15	B00515	INDICATOR SPRING CONNECTING LINK	1
16	B00516	HINGE SCREW D=6.35 H=9.6	1
17	B00517	HANDLE & INDICATOR SPRING	1
18	B00518	SCREW 9/64-40 L=6	3
19	B00519	CAM ROLL	2
20	B00520	LENGTHWISE FEED LEVER	1
21	B00521	LENGTHWISE FEED LEVER SLIDE BLOCK	1
22	B00522	CAM ROLL SCREW STUD M10-1.25 D=8.0	2
23	B00523	FEED STUD	2
24	B00524	CAM ROLL SCREW STUD	1
25	B00525	LENGTHWISE FEED GRADUATE PLATE	1
26	B00526	SCREW 3/16-28 L=6	1
27	B00527	HINGE SCREW D=6.35 H=4.8	1
28	B00528	INTERMEDI CONNECTING LINK	2
29	B00529	SCREW 15/64-28 L=20	1
30	B00530	CROSSWISE FEED LEVER	1
31	B00531	CAM SHAFT	1
32	B00532	CAM BOSS	2
33	B00533	SCREW M8-1.25 L=8	4
34	B00534	CAM SHAFT BUSHING, RIGHT	1
35	B00535	SCREW 15/64-28 L=10.5	2
36	B00536	CROSSWISE FEED CAM	1
37	B00537	LENGTHWISE FEED CAM	1
38	B00538	SCREW 9/32-28 L=13.5	5
39	B00539	CAM SHAFT BUSHING, LEFT	1
40	B00540	SCREW M2.5x8	2
41	B00541	CROSSWISE FEED GRADUATED PLATE WASHER	2
42	B00542	CROSSWISE FEED GRADUATED PLATE	1
43	B00543	FEED PLATE	1
44	B00544	FEED PLATE (473)	1
45	B00545	LENGTHWISE FEED CAM (473)	1
46	B00546	CROSSWISE FEED CAM (473)	1
47	B00547	CROSSWISE FEED CAM (473X)	

6. BUTTON CLAMP LIFTER COMPONENTS



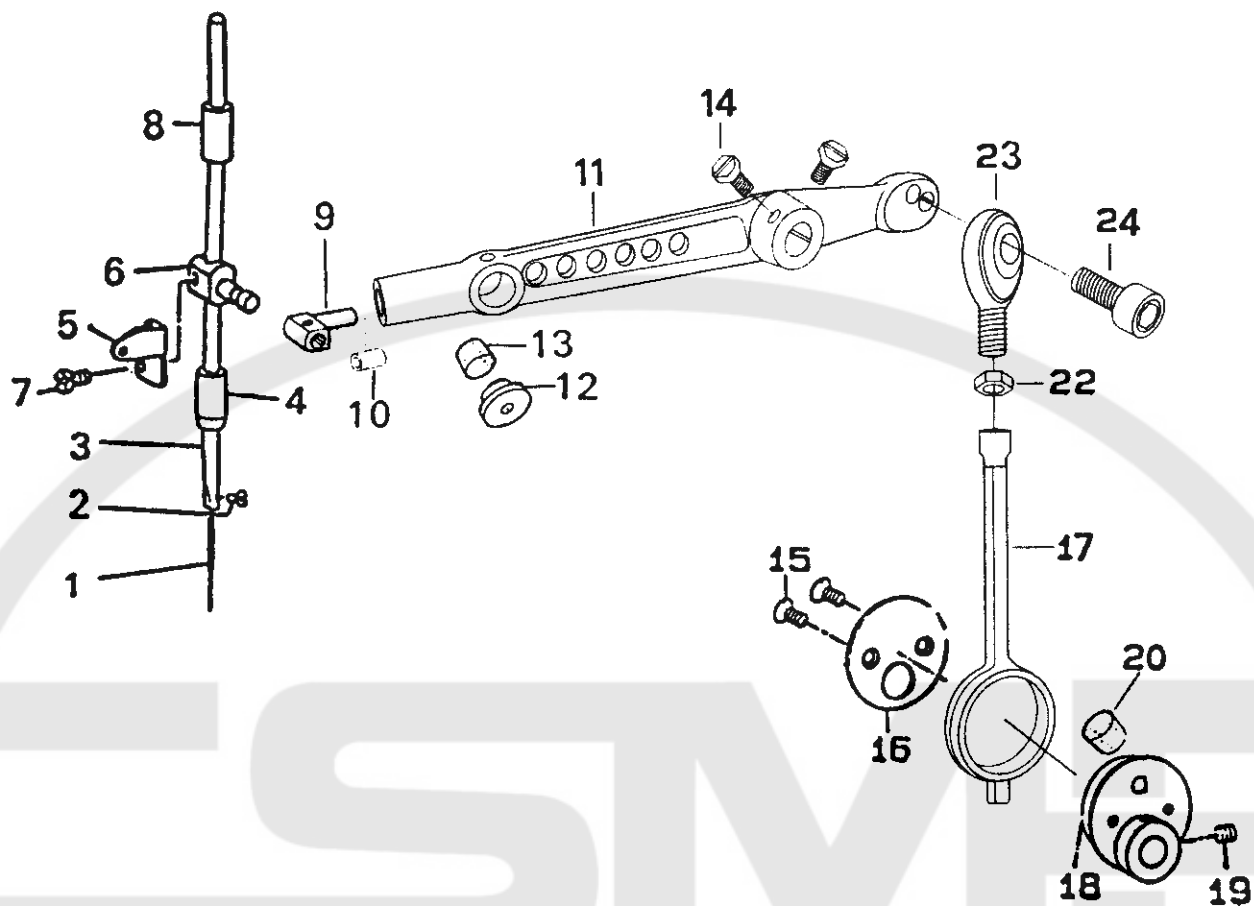
	Part No.	Description	Amt. Req.
1	B00601	BUTTON CLAMP LIFTING LEVER	1
2	B00602	BUSHING	1
3	B00603	BUTTON CLAMP LIFTING LEVER SHAFT	1
4	B00604	NIPPER BAR ACTUATING LEVER SPRING	1
5	B00605	WASHER	1
6	B00606	BUTTON CLAMP LIFTING LINK	1
7	B00607	SLIDING ROLLER	1
8	B00608	SCREW 1/4-40 L=6	1
9	B00609	ECCENTRIC CAM	1
10	B00610	SCREW 1/4-40 L=6	2
11	B00611	BUTTON CLAMP LIFTING	1
12	B00612	THRUST COLLAR	2
13	B00613	SCREW 11/64-40 L=3.5	4
14	B00614	LEVER SHAFT	1
15	B00615	SCREW 15/64-28 L=10.5	2
16	B00616	LIFTING LINK CONNECTING LINK	1
17	B00617	LIFTING LINK LEVER	1
18	B00618	SCREW M5-0.8 L=14	1
19	B00619	HINGE SCREW M5-0.8 L=8	1
20	B00620	HINGE SCREW D=6.35 H=2.1	1
21	B00621	NUT	1
22	B00622	BUTTON CLAMP LIFTING ROD ROLL	1
23	B00623	WASHER	1
24	B00624	BUTTON CLAMP LIFTING ROD	1
25	B00625	SPRING	1
26	B00626	WASHER	3
27	B00627	CUSHION	2
28	B00628	WASHER	1
29	B00629	SCREW 15/64-28 L=11	1
30	B00630	CONNECTING LINK, FRONT	1
31	B00631	JOINT STUD	1
32	B00632	FEED ADJUSTING JOINT	1
32	B00633	WASHER	1
34	B00634	NUT	2
35	B00635	CONNECTING SCREW	1
36	B00636	NUT 15/64-24	2
37	B00637	CONNECTING LINK, REAR	1
38	B00638	HINGE SCREW M6-1.0 D=8.0 H=3.2	1
39	B00639	HINGE SCREW M6-1.0 D=8.0 H=3.2	1
40	B00640	NUT M6-1.0	1
41	B00641	NUT M6-1.0	1
42	B00642	THREAD TRIMMING LINK	1
43	B00643	HINGE SCREW M6-1.0 D=8.0 H=3.2	1
44	B00644	NUT M6-1.0	1
45	B00645	THREAD TRIM LEVER BASE	1
46	B00646	SCREW 11/64-40 L=14	2
47	B00647	THREAD TRIMMING LINK	1
48	B00648	HINGE SCREW D=6.35 H=13.2	1

7. NEEDLE DRIVING PULLEY SHAFT MECHANISM COMPONENTS



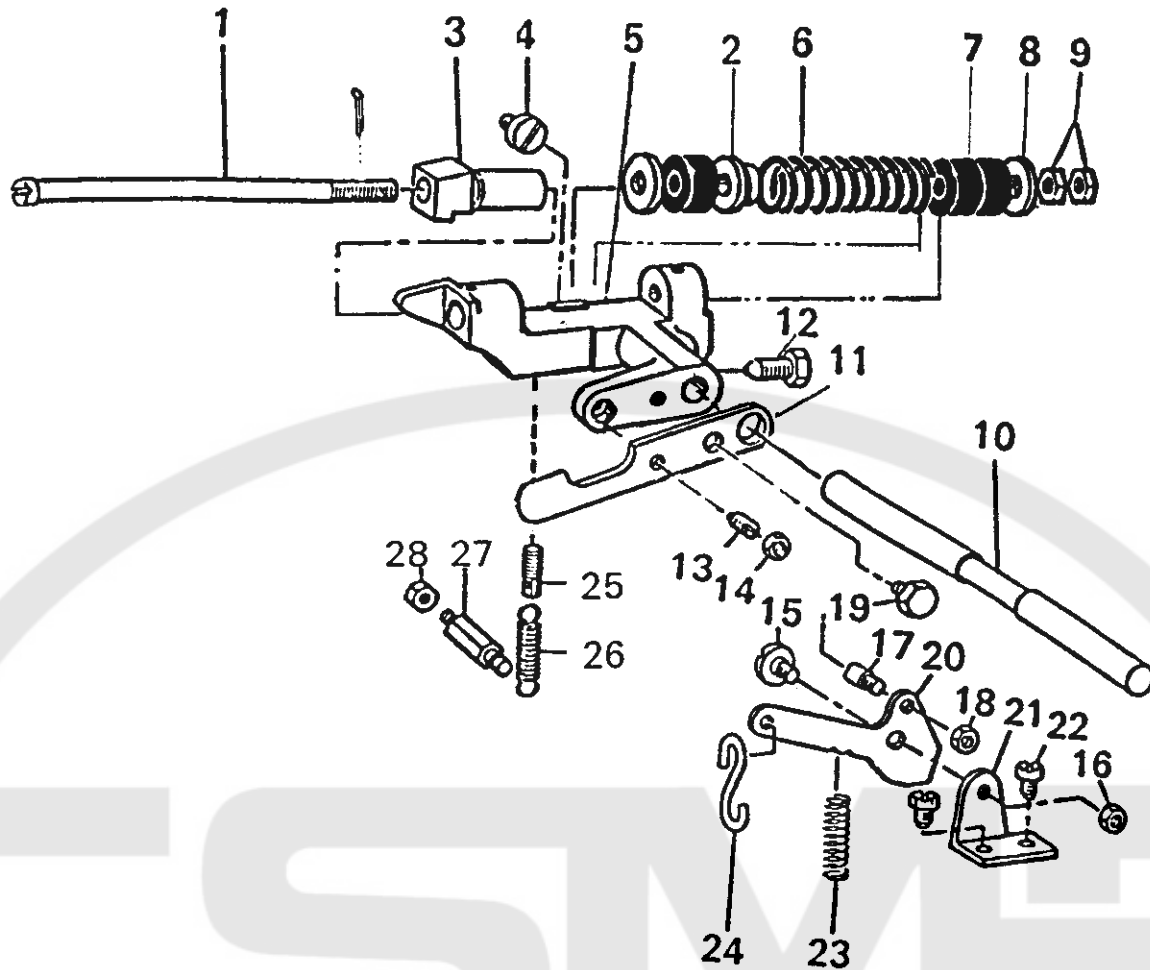
	Part No.	Description	Amt. Req.
1	BO0701	BALL LARGE	1
2	BO0702	PULLEY INSERT	1
3	BO0703	BALL SMALL	1
4	BO0704	SPRING	1
5	BO0705	NEEDLE DRIVING PULLEY	1
6	BO0706	SCREW 11/64-40 L=6.5	1
7	BO0707	SCREW 15/64-28 L=4	1
8	BO0708	NEEDLE BEARING	2
9	BO0709	GREASE RETAINING WICK	1
10	BO0710	RETAINING WASHER	1
11	BO0711	SCREW 15/64-28 L=23.5	2
12	BO0712	SCREW	2
13	BO0713	NEEDLE DRIVING PULLEY CLUTCH DISC	1
14	BO0714	SEAL PLUG	1
15	BO0715	STOP MOTION DISC PAWL	1
16	BO0716	STOP MOTION DISC LATCH	1
17	BO0717	SCREW D=6.35 H=16	2
18	BO0718	SPRING	1
19	BO0719	SCREW 5/16-24 L=10	2
20	BO0720	SCREW 5/16-24 L=17	2
21	BO0721	THRUST BALL BEARING	1
22	BO0722	ECCENTRIC WASHER	1
23	BO0723	NEEDLE BEARING	1
24	BO0724	SCREW 15/64-28 L=10.5	2
25	BO0725	LOOPER & CAM SLEEVE	1
26	BO0726	PULLEY SHAFT BUSHING, LEFT	1
27	BO0727	DRIVING GEAR	1
28	BO0728	SCREW 1/4-40 L=6	2
29	BO0729	NEEDLE DRIVING PULLEY SHAFT	1
30	BO0730	STOP MOTION DISC	1
31	BO0731	TALLOW COVER	1

8. NEEDLE BAR DRIVING MECHANISM COMPONENTS



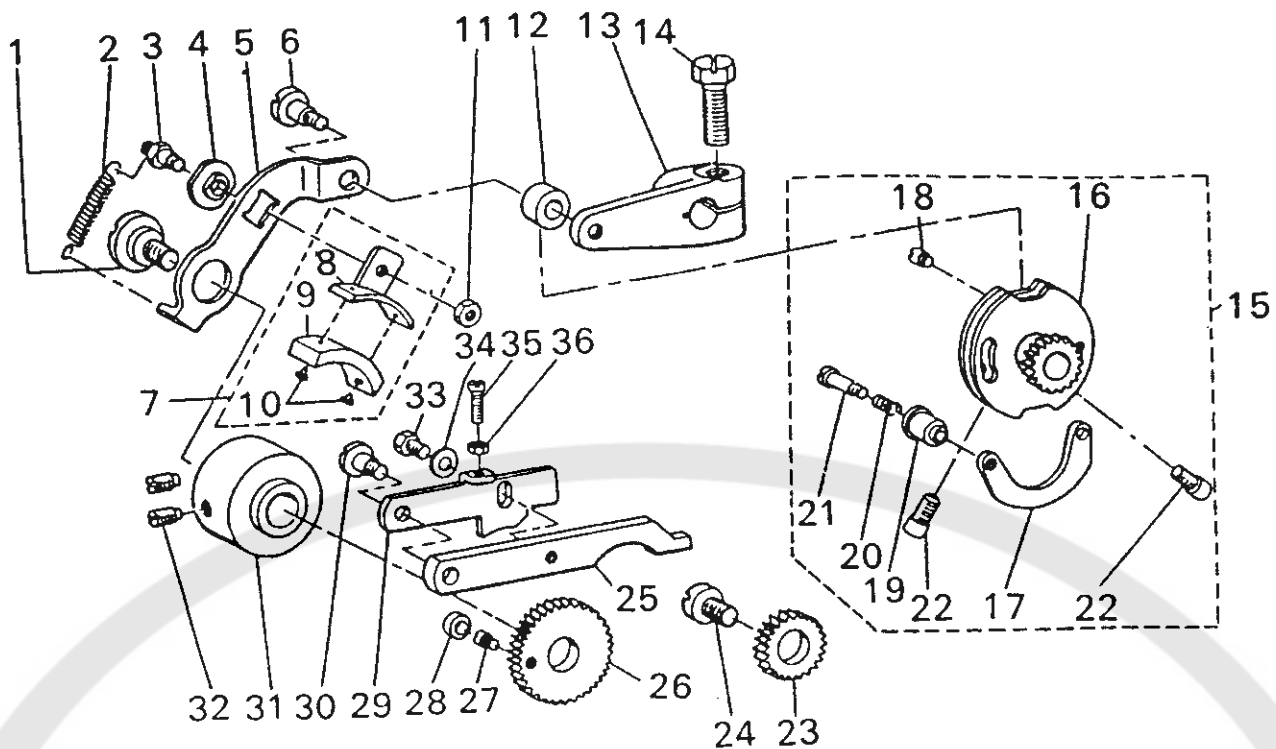
	Part No.	Description	Amt. Req.
1	B00801	NEEDLE	1
2	B00802	SCREW 1/8-44 L=4.5	1
3	B00803	NEEDLE BAR	1
4	B00804	NEEDLE BAR BUSHING, LOWER	1
5	B00805	NEEDLE BAR BALANCE	1
6	B00806	NEEDLE BAR CLAMP	1
7	B00807	SCREW 9/64-40 L=12	1
8	B00808	NEEDLE BAR BUSHING, UPPER	1
9	B00809	NEEDLE BAR BEARING BLOCK	1
10	B00810	BUSHING	1
11	B00811	NEEDLE BAR LEVER	1
12	B00812	SEAL PLUG	1
13	B00813	OIL FELT	1
14	B00814	SCREW 15/64-28 L=15.5	2
15	B00815	SCREW 11/64-40 L=8.5	2
16	B00816	THRUST HOLDER	1
17	B00817	CRANK ROD	1
18	B00818	ECCENTRIC CAM	1
19	B00819	SCREW 1/4-40 L=6	2
20	B00820	OIL WICK	1
21	B00821	OIL WICK	1
22	B00822	NUT-M8	1
23	B00823	BALL BEARING	1
24	B00824	SCREW 9/32-28	1

9. STOP MOTION MECHANISM COMPONENTS



	Part No.	Description	Amt. Req.
1	B00901	STOP MOTION PLUNGER ROD	1
2	B00902	SEAL PLUG	1
3	B00903	STOP MOTION PLUNGER	1
4	B00904	SCREW 15/64-28 L=10	1
5	B00905	STOP MOTION PLUNGER LEVER	1
6	B00906	STOP MOTION DISC SPRING	1
7	B00907	RUBBER CUSHION	3
8	B00908	WASHER	2
9	B00909	NUT	2
10	B00910	STOP MOTION LEVER SHAFT	1
11	B00911	STOP MOTION DISC PRESSURE LEVER	1
12	B00912	SCREW	1
13	B00913	SCREW 15/64-28 L=15	1
14	B00914	NUT	1
15	B00915	HINGE SCREW D=8.0 H=3.0	1
16	B00916	NUT	1
17	B00917	STOP SCREW	1
18	B00918	NUT	1
19	B00919	SCREW 15/64-28 L=10.5	1
20	B00920	STOP MOTION TRIP LEVER	1
21	B00921	STOP MOTION TRIP LEVER BRACKET	1
22	B00922	SCREW M6-1.0 L=12	2
23	B00923	SPRING	1
24	B00924	S SHAPED HOOK	1
25	B00925	SPRING HANGER M6-1.0 L=21	1
26	B00926	STOP MOTION LEVER SPRING	1
27	B00927	SCREW STUD	1
28	B00928	NUT	1

10. STITCH SELECTING PARTS COMPONENTS



	Part No.	Description	Amt. Req.
1	B01001	HINGE SCREW D=12.7 H=3.2	1
2	B01002	SPRING	1
3	B01003	FRICTION PLATE ROTATING STUD	1
4	B01004	SLIDE BLOCK	1
5	B01005	SPEED SLOWING LEVER	1
6	B01006	HINGE SCREW D=7.94 H=13.3	1
7	B01007	FRICTION PLATE HOLDER ASM.	1
8	B01008	FRICTION PLATE HOLDER	1
9	B01009	SPEED SLOWING FRICTION PLATE	1
10	B01010	POSITIONING PIN	2
11	B01011	NUT	1
12	B01012	STOP MOTION TRIPPING LEVER CAM ROLL	1
13	B01013	STOP MOTION TRIPPING LEVER	1
14	B01014	SCREW M8-1.25 L=20	1
15	B01015	STOP MOTION CAM ASM.	1
16	B01016	STOP MOTION CAM	1
17	B01017	STOP MOTION CAM SHOE	1
18	B01018	SCREW	1
19	B01019	STOP MOTION CAM KNOB	1
20	B01020	SPRING	1
21	B01021	HINGE SCREW D=4.8 H=14.5	1
22	B01022	SCREW 15/64-28 L=10.5	2
23	B01023	STITCH SELECTING SPUR GEAR	1
24	B01024	SCREW STUD	1
25	B01025	STITCH SELECTING LEVER	1
26	B01026	STITCH SELECTING SPUR GEAR, LARGE	1
27	B01027	SCREW	1
28	B01028	ROLL	1
29	B01029	STITCH SELECTING LATCH	1
30	B01030	HINGE SCREW D=6.35 H=9.6	1
31	B01031	SPEED SLOWING FRICTION WHEEL	1
32	B01032	SCREW 15/64-28 L=10.5	2
33	B01033	SCREW 11/64-40 L=9.5	1
34	B01034	WASHER	1
35	B01035	SCREW 1/8-44 L=12	1
36	B01036	SCREW 1/8-44 L=4.5	1

INSTRUCTION MANUAL

1. INSTALLATION OF MACHINE HEAD
2. LUBRICATION
3. ATTACHING THE NEEDLE
4. ATTACHING THE NEEDLE BAR GUARD
5. ADJUSTMENT OF THE NIPPER
6. POSITION OF THE NEEDLE GUIDE
7. HEIGHT OF THE BUTTON CLAMP
8. WORK PRESSING FORCE
9. ADJUSTMENT OF THE BUTTON CLAMP STOP LEVER
10. TIMING OF THREAD TENSION RELEASE
11. SETTING FOR 2-OR 4-HOLE BUTTONS
12. ATTACHING THE BUTTON TRAY ASSEMBLY
13. THREADING THE MACHINE
14. THREAD TENSION ADJUSTMENT
15. ADJUSTMENT OF THE THREAD PULL-OFF LEVER
16. NEEDLE-TO-LOOPER RELATION
17. SETTING A NUMBER OF STITCHES
18. AUTOMATIC THREAD TRIMMER (EXCLUSIVE FOR 473)
19. SUBCLASS MODELS
20. ATTACHMENTS
21. SPECIFICATIONS
22. MOTOR PULLEY AND BELT
23. TROUBLES AND CORRECTIVE MEASURES

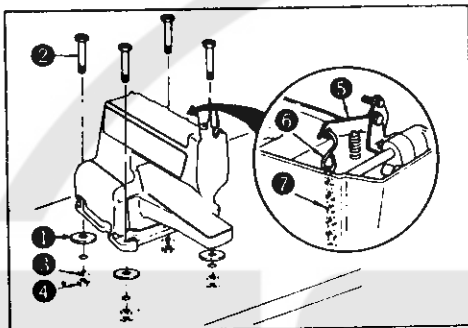
CAUTION BEFORE OPERATION

1. Before applying power, release the stop-motion mechanism and turn by hand the needle driving pulley in order to ensure that the machine is in order.
2. Be sure to apply oil to the lubrication points marked with an arrow before operating the sewing machine. Also sufficiently lubricate the oil felt placed inside the bed mounting base.
3. Make sure that the machine rotates backwards when viewed from the operator's side. Don't let it rotate in the reverse direction.

CAUTIONS IN OPERATION

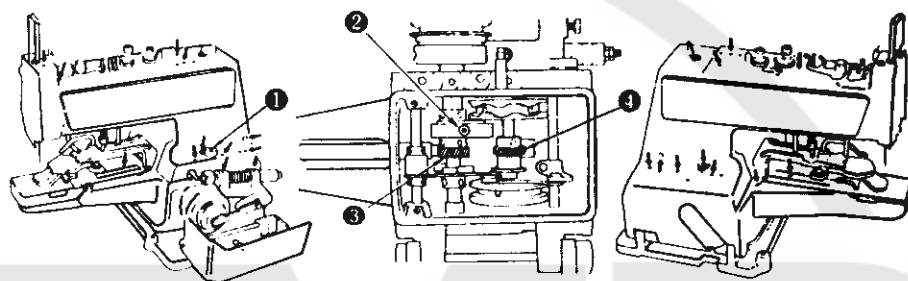
1. Don't put your hand under the needle when you turn the main switch "on" or operate the machine.
2. Don't put your fingers into the thread take-up cover, or any other component near it.
3. Don't forget to turn the main switch "off" before you tilt the machine head back or remove the V-belt.
4. Never bring your fingers or hair close to, or place anything on the handwheel, V-belt, motor and any other component near them during operation. It may lead to serious personal injuries.
5. If your machine is provided with a belt cover, finger guard and eye guard, never operate your machine with any of them removed.

1. INSTALLATION OF MACHINE HEAD



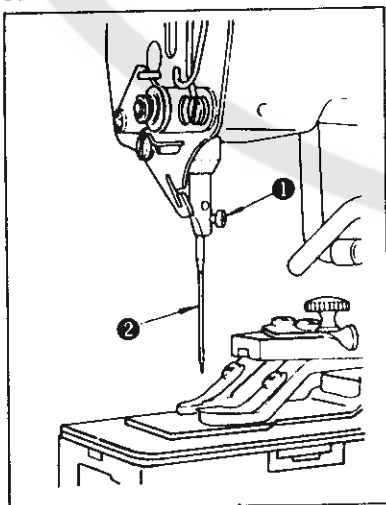
Put rubber cushion ① on the table, place the machine head on the rubber cushion and fix it to the table using screws ②, plain washers ③ and nuts ④. Attach "S" chain hook ⑥ and chain ⑦ to stop motion trip lever ⑤.

2. LUBRICATION



1. Apply New Defrix Oil No. 1 to the components shown by the arrows. (Once or twice a week)
2. Loosen connecting screw ①, tilt the head backward and apply some grease to driving worm gear ④ and gear ③.
3. Check, approximately once a week, that oil amount is sufficient to reach the top of the oil felt placed inside the bed mounting base. If the amount of oil is insufficient, add an adequate amount of oil. At this time, also apply oil to crank rod ②.

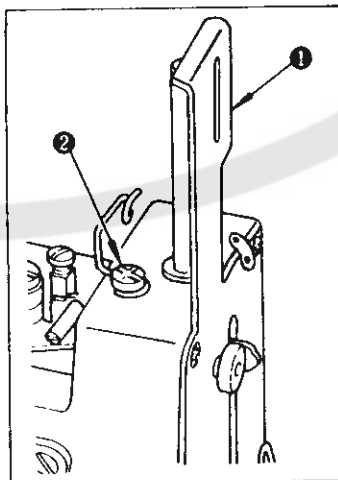
3. ATTACHING THE NEEDLE



- ★ Turn OFF the power to the motor.
- ★ Use a standard needle of TQx7 #16

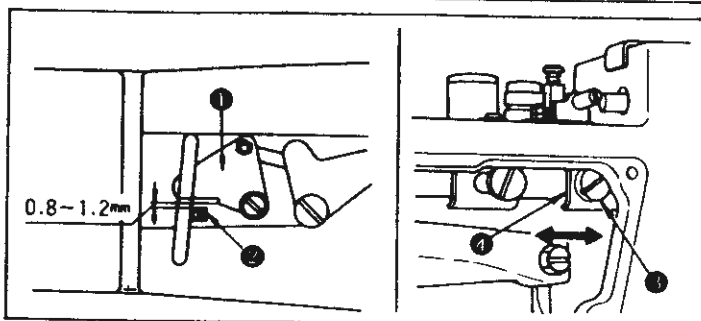
1. Loosen screw ①.
2. Insert needle ② up into the needle hole in the needle bar until it comes in contact with the deepest end of the needle hole.
3. Tighten screw ① firmly.

4. ATTACHING THE NEEDLE BAR GUARD



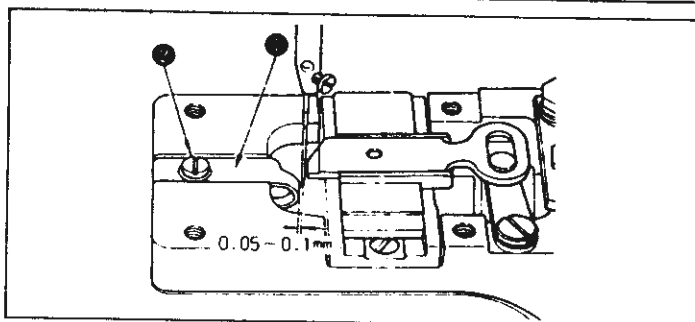
1. Loosen screw ② and remove the thread guide No. 2.
 2. Place needle bar guard ① under the thread guide No. 2.
 3. Fix the thread guide No. 2 and needle bar guard ① together using screw ②.
- (Notes) If your machine has a wiper magnet, attach the needle bar guard on to the wiper magnet base.

5. ADJUSTMENT OF THE NIPPER



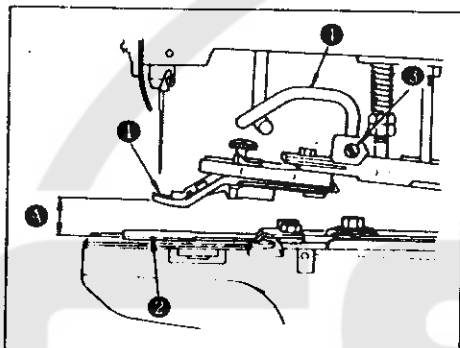
Provide a 0.8 to 1.2 mm clearance between nipper ① and nipper block ② to prevent the nipper from nipping the thread while stitching. Loosen screw ③ and move nipper bar block ④ to the left or the right.

6. POSITION OF THE NEEDLE GUIDE



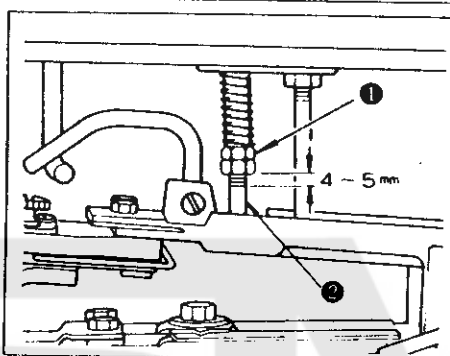
Loosen screw ③ and provide a 0.05 to 0.1 mm clearance between the needle guide ① and the needle by moving the needle guide ① to the left or the right when the needle is in the lowest position.

7. HEIGHT OF THE BUTTON CLAMP



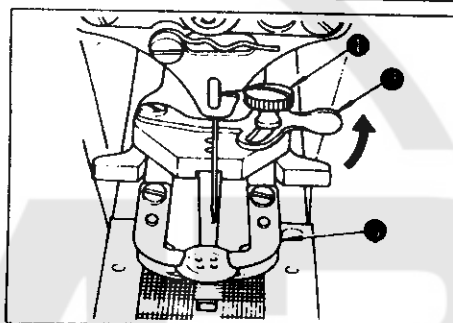
The standard clearance ① between the bottom face of button clamp jaw lever ① and the top face of feed plate ② is 12 mm for 473 and 9 mm for 472. Loosen screw ③ and adjust the height of button clamp lifting hook ④.

8. WORK PRESSING FORCE



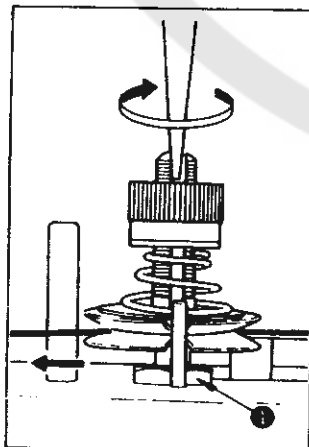
The standard work pressing force is obtained by providing a 4 to 5 mm clearance between the bottom face of nut ① and the bottom end of the screw of pressure adjusting bar ②.

9. ADJUSTMENT OF THE BUTTON CLAMP STOP LEVER



Set the machine for stop-motion state, loosen clamp screw ③, place a button correctly in the sewing position and adjust button clamp stop lever ① to permit the button properly to rest on button clamp jaw levers ②. Tighten clamp screw ③ after determining the distance between the left and right jaw levers ④.

10. TIMING OF THREAD TENSION RELEASE



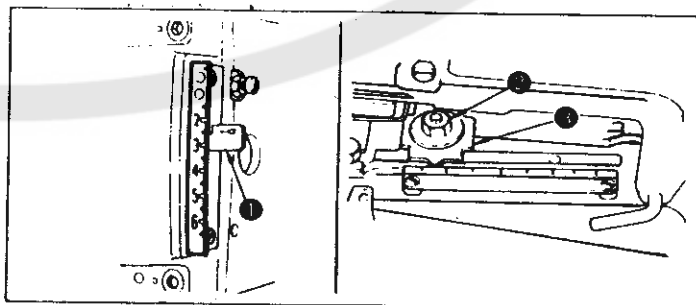
Turn the needle driving pulley as you draw the thread in the direction of the arrow as illustrated, and you will find a point at which the tension disc on the tension post No. 2 release the thread. At this moment, the standard distance from the top end of the needle bar down to the top end of the needle bar bushing (upper) is 54 to 56 mm. Relation of the needle bar height (above-mentioned distance; 54 to 56 mm) to the timing of thread tension release is adjustable by turning the tension post No. 2; loosen nut ①, insert the blade of a screw driver to the top slot of the tension post No. 2 and turn it in the direction of the arrow to

lower the needle bar, (to reduce the said distance), and vice versa. Your adjustment is required when the following troubles are frequency;

1. When the stitch made on the wrong side of the workpiece is too loose; --- Make the needle bar slightly higher.
2. When the thread is broken at the time of stop-motion; --- Make the needle bar slightly higher.
3. When the thread is broken frequently; --- Make the needle bar slightly lower.

11. SETTING FOR 2-OR 4-HOLE BUTTONS

Measure the distance between two holes in a button and set equally crosswise and lengthwise feed regulators for 4-hole buttons.



★ Lengthwise feed

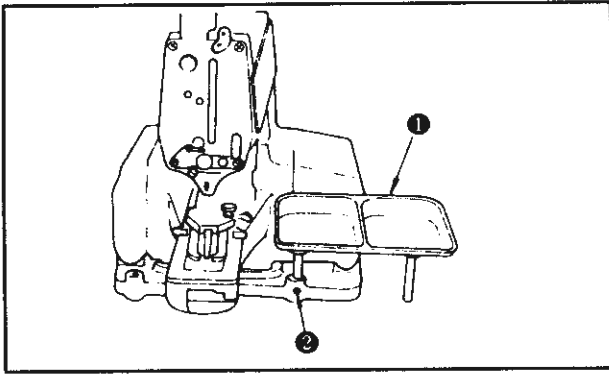
Push down lengthwise feed adjusting lever ① and set it to "0" for 2-hole buttons or a corresponding amount for 4-hole buttons.

★ Crosswise feed

Crosswise nut ② and set pointer ③ to a corresponding amount indicated by the crosswise feed graduation plate. Tighten firmly nut ②.

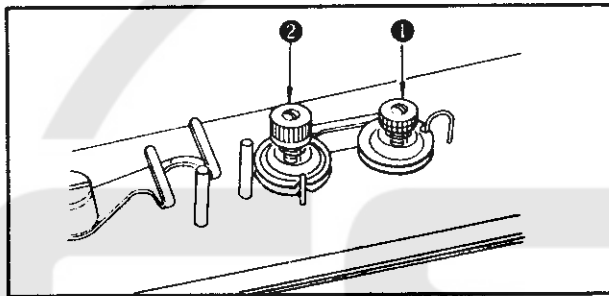
(Caution) Before operating the machine, ensure that the needle enters the center of each hole in the button.

12. ATTACHING THE BUTTON TRAY ASSEMBLY



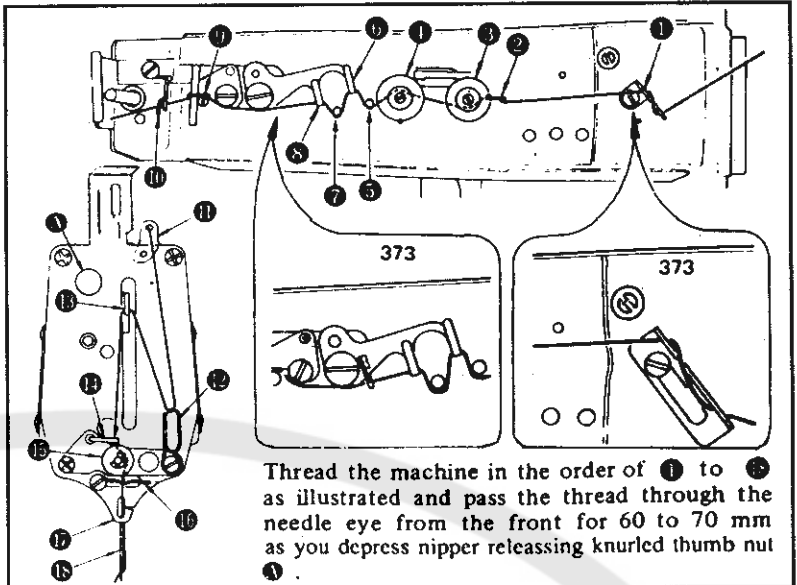
Insert the posts of button tray ① in hole on the right of the machine sub-base and tighten each setscrew ②. You may use also the installation hole on the left if the operator wants.

14. THREAD TENSION ADJUSTMENT



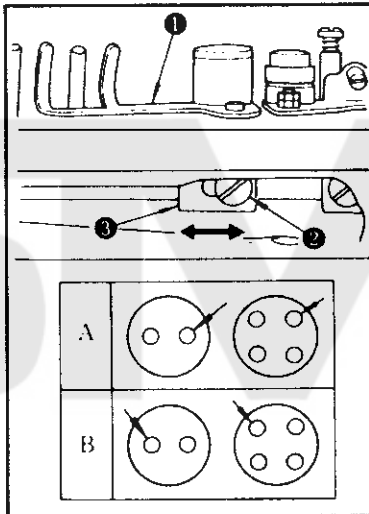
Tension post No. 1 ① is used to adjust the thread tension to sew on the button and a relatively low tension will be enough. Tension post No. 2 ② is used to adjust the thread tension applied to the root of the button sewing stitches. This tension must be determined according to the type of thread, fabric and thickness of the button and must be higher than that of tension post No. 1 ①. Turn the tension nuts clockwise to increase or counterclockwise to reduce the thread tension. Turn the adjusting nut clockwise to increase or counterclockwise to reduce the tension.

13. THREADING THE MACHINE



Thread the machine in the order of ① to ⑯ as illustrated and pass the thread through the needle eye from the front for 60 to 70 mm as you depress nipper releasing knurled thumb nut ①.

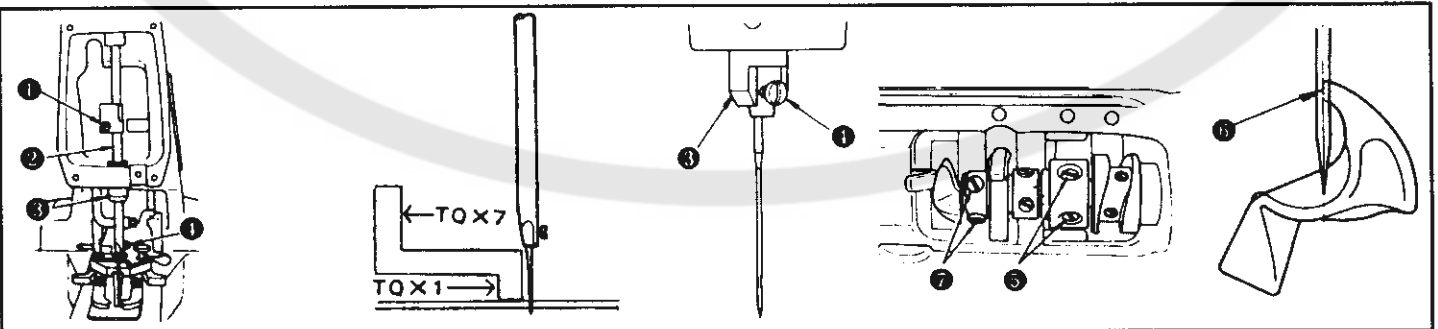
15. ADJUSTMENT OF THE THREAD PULL-OFF LEVER



Adjustment of the thread pull-off lever ①, insert a screw driver through an opening in the machine arm side cover (left), loosen screw ② and adjust the position of nipper bar block (rear) ③ to the left or the right.

If the end of thread is drawn from arrow hole A in the button after sewing, change the position of nipper bar block (rear) ③ to the left. Move the lever to the right when the thread end comes out from arrow hole B.

16. NEEDLE-TO-LOOPER RELATION



★ Adjust the needle-to-looper relation as follows;

1. Depress the pedal fully forward, turn the needle driving pulley in the normal sewing direction to bring down the needle bar to the lowest point of its stroke and loosen screw ①

(Adjusting the needle bar height)

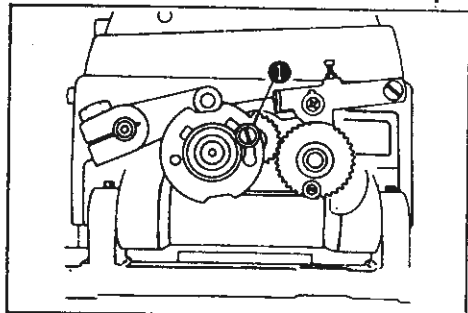
2. Adjust the height of the needle bar using top two lines engraved on the needle bar for the TQx1 needle and using the bottom two lines for the TQx7 needle. Align the upper line ① with the bottom end face of needle bar bushing (lower) ② and tighten screw ③ in the way that needle clamp screw ④ rests in the slot of the needle bar bushing (lower) ②

(Looper position)

3. Loosen screws ⑤ and turn by hand the needle driving pulley until lower line ⑥ of two lines aligns with the bottom end face of needle bar bushing (lower) ②.
4. By keeping the machine in this state, align looper blade ⑦ with the center of the needle and tighten screws ⑧
5. Loosen screw ⑦ and provide a 0.05 to 0.1 mm clearance between the looper and the needle. Tighten screw ⑦

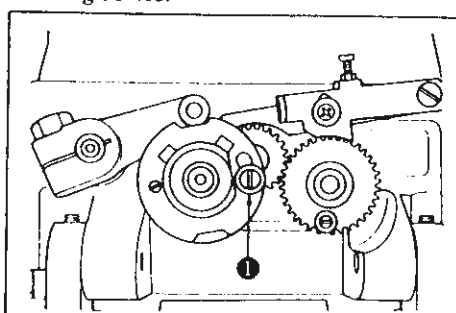
17. SETTING A NUMBER OF STITCHES

A number of stitches to sew a button is set by stitch adjusting cam knob ①, stitch selecting lever (small) ②, adjusting screw ③ and clamp screw ④ which are accessible by opening the left-hand cover (stop-motion & pulley cover). You can easily adjust these components without removal of the speed-decreasing device.



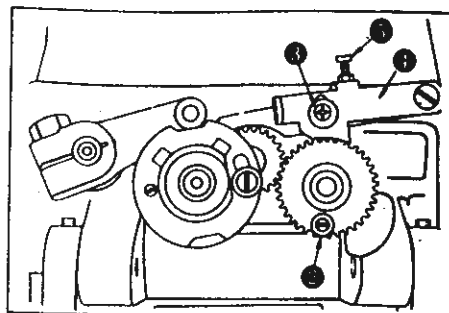
★ 8 stitches (6 stitches)

Pull stitch adjusting cam knob ① and set it as shown in the illustration.



★ 16 stitches (12 stitches)

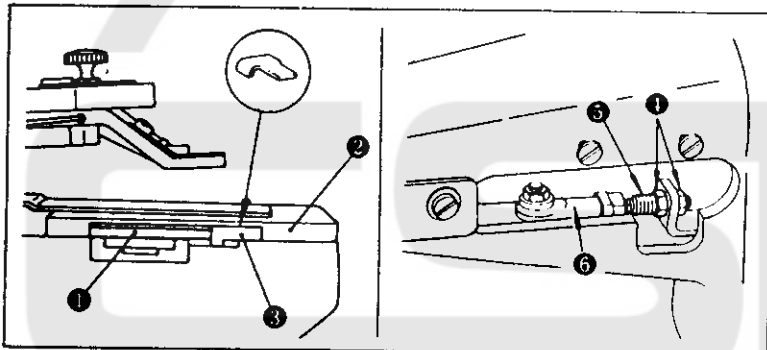
When stitch cam knob ① being set for "8 stitches" has arrived at the right end as illustrated, set knob ① in the illustrated position.



★ 32 stitches (24 stitches)

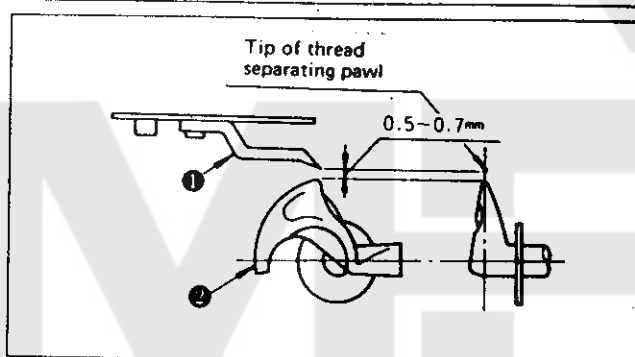
When stitch adjusting roller ② arrived at the lowest point of its trajectory with the 16-stitch setting, loosen clamp screw ④, push down stitch selecting lever (small) ① with your fingers and retighten screw ③. If the machine does not make 32 stitches, loosen clamp screw ④ and turn adjusting screw ③ until 32 stitches are made.

18. AUTOMATIC THREAD TRIMMER (EXCLUSIVE FOR 473)



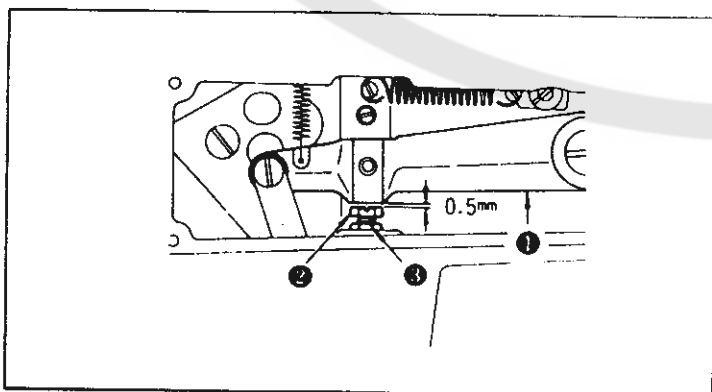
★ Position of the moving knife

When the machine stops in the state of "stop-motion" and its button clamp assembly rests in the highest position, there must be a standard clearance of 14.5 mm between thread trimming connecting link (front) ① and the end face of the slit in throat plate ②. This clearance is determined gauge ③ which is stored in the accessory box; tilt the head backwards, remove the bed oil shield, loosen two nuts ④ and adjust the clearance by moving connecting screw ⑤ in the axial direction. When you tighten two nuts ④, ensure that joint ⑥ stays in the horizontal position.



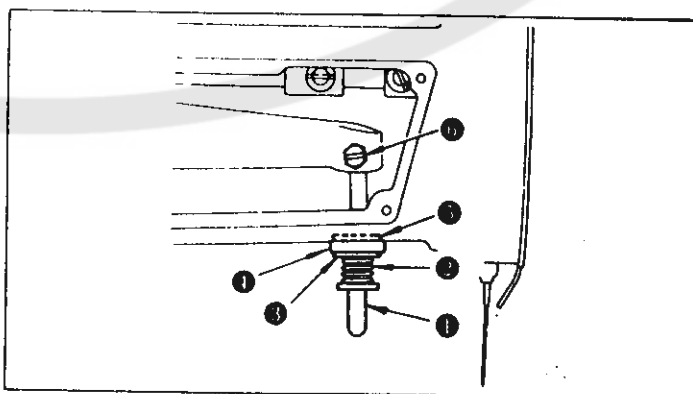
★ Height of the moving knife thread separation nail

There must be a 0.5 to 0.7 mm clearance between looper blade point ② and thread separation nail ①. If nail ① does not provide the necessary clearance, bend the nail slightly and adjust the clearance.



★ Clearance between the button clamp lifting lever and the adjusting screw

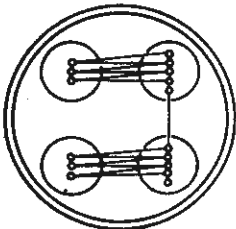
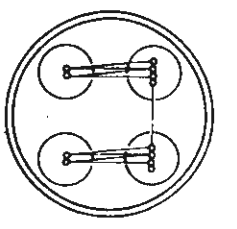
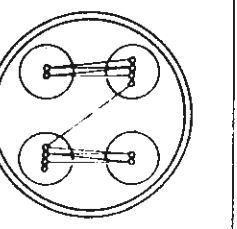
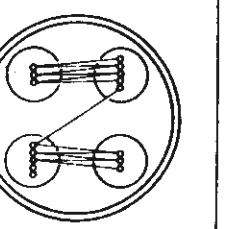
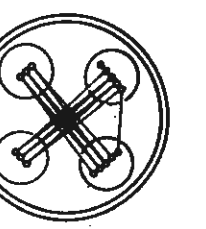
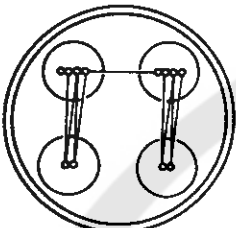
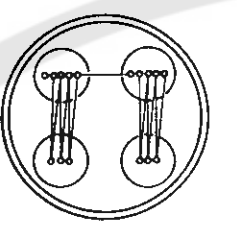
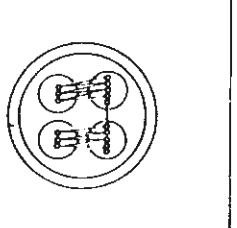
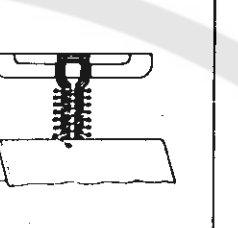
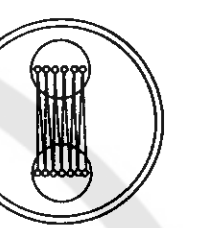
Provide a 0.5 mm clearance between button clamp lifting lever ① and adjusting screw ② and then tighten nut ③.





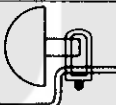


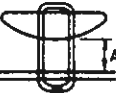


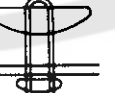

★ How to set the L-shaped lifting rod

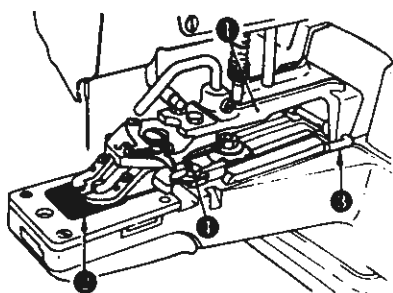
Put moving knife push-back spring ②, stop-motion rubber cushion ① and stop-motion rubber cushion washer ⑤, in this order, to L-shaped lifting rod ④. After making sure that the stop-motion mechanism has engaged completely, fix the L-shaped lifting rod by tightening screw ⑥ in the way that the end face of the stop-motion rubber cushion washer comes into close contact with the jaw of the machine arm.

19. SUBCLASS MODELS

472 473	472 -4 473 -4	472 -5 473 -5	472-10 473-10	472-11 473-11
8, 16, 32 stitches	6, 12, 24 stitches	6, 12, 24 stitches	8, 16, 32 stitches	8, 16, 32 stitches
				
472-6 473-6	472-12 473-12	472-16/Z010-B 473-16/Z040-B	472-15/Z016 473-15/Z046	472-14 473-14
6, 12, 24 stitches	8, 16, 32 stitches	8, 16, 32 stitches	16, 32 stitches	8, 16, 32 stitches
				

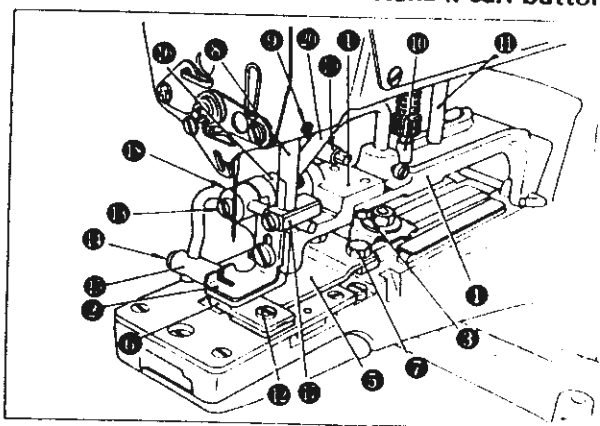
20. ATTACHMENTS

Use	Flat buttons		Shank buttons		Snaps
	Large-size	Medium-size	General	Luis type	
472	Z001	Z002	Z003	Z010	Z007
473	Z031	Z032	Z033	Z040	Z037
Schematic drawing					
Remarks	Button size: A:3~6.5mm B:φ20~28mm	Button size: A:3~5mm B:φ12~20mm	Button diameter: Less than 16mm Shank size: Thickness: 6~5mm Width: 3~2.5mm	Button size: Same as Z003 (Z033), but possible to sew buttons hav- ing some variations of shank in shape.	Snap size: A:8mm
Use	Wrapped-around buttons		Metal buttons		Labels
	First process	Second process	General	Stay button	
472	Z004	Z005	Z008	Z009	Z014
473	Z004	Z035	Z038	Z039	Z044
Schematic drawing					
Remarks	Thread shank height: A:5.5mm			Common to Z004	Stitch width: 3~6.5mm



In order to install the attachment on the machine, you may have to remove the button clamp mechanism ① or feed plate ②. Dislocate a snap ring from button clamp installing stud ③, and you will be able to remove button clamp mechanism assembly ①. Loosen setscrews ④, and you can remove feed plate ②.

★ Attachment for shank buttons (Pearl buttons) (Z003, Z010, Z033, Z040)



(INSTALLATION)

Remove both the button clamp mechanism assembly and the feed plate from the machine and install attachment ① in place. Loosen screws ③ and adjust button clamp bracket ① to permit the needle to come down in the middle of the needle slot in shank button adaptor ②. Attach button clamp feed plate ⑤ using screws ⑦ in the way that it permits the needle to come down in the middle of the needle slot in feed plate ⑥. Insert the top end of button clamp stud ⑧ into an opening in the jaw of the machine arm and fasten it by screw ④.

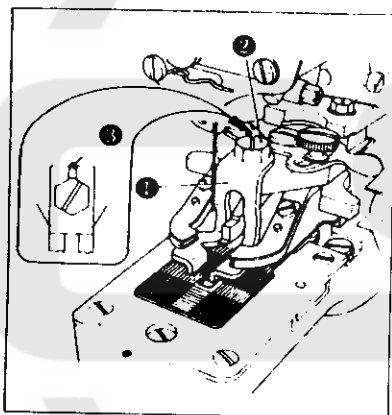
(When attaching Z010 or Z040, you must change also button clamp pressure adjusting bar ⑩ and button clamp stopper pin ⑪ at the same time.)

(ADJUSTMENT AND OPERATION)

1. Loosen screw ⑫, let feed plate ⑥ recedes 0.5 to 1.0 mm from the left end of button clamp jaw lever ② and retighten screw ⑫.
2. Set a button in place, loosen screws ⑬ and ⑭ and align shank button holding clamp ⑮ with the center of the button.
3. Shank button holding clamp ⑮ must give proper pressure to the button so that the button stays steadily in position while being sewn. Loosen a setscrew in thrust collar ⑯ and rotate the thrust collar until shank button holding clamp ⑮ provides proper pressure.
4. You may fix button clamp block ⑰ in a convenient position for operation.

(Caution) 1. When you fix the thrust collar, ensure that button clamp rotating shaft ⑮ does not play axially in its bracket.
2. Adjust lifting hook ⑱ and stopper pin ⑪ so that L-shaped lifting rod roller ⑲ does not come in contact with button clamp bracket ①.

★ Attachment for the first process of wrapped-around buttons (Z004)



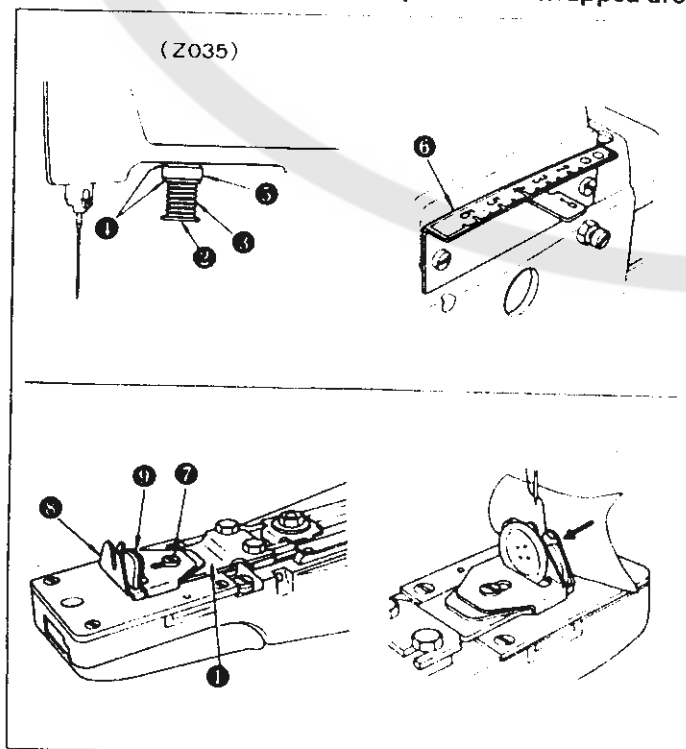
(INSTALLATION)

Attach wrapped-around button foot ① to the ordinary button clamp jaw levers using screw ② and guide pin screw ③. Align foot ① with the jaw levers so that they permit a button to rest in the middle.

(ADJUSTMENT AND OPERATION)

Adjustment and operation is almost same as those for the flat buttons, but you must adjust the thread pull-off lever to provide more amount of thread in order to make the thread loose below the button for thread shank formation. (See 8. Adjustment of the thread pull-off lever).

★ Attachment for the second process of wrapped-around buttons (Z005, Z035)



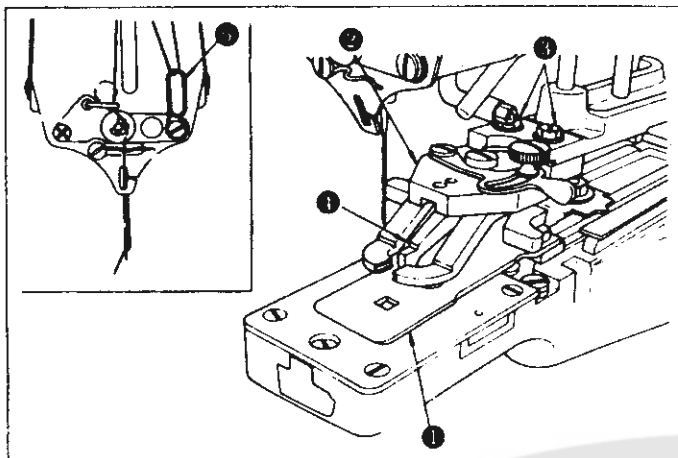
(INSTALLATION)

Remove the button clamp mechanism assembly, button clamp pressure adjusting bar and feed plate from the machine and install attachment for the second process of wrapped-around buttons ①. When you install a Z035 attachment, you must remove also the L-shaped lifting rod. Insert moving knife push-back spring ③, washer ④, cushion ⑤ and washer ⑥ in spring guide shaft ② in this order. Make certain that the stop-motion mechanism has completely engaged, and install the attachment assembly in place in the way that cushion ⑤ comes into close contact with the surface of the machine arm without play. Then, replace lengthwise feed graduated plate ⑦.

(ADJUSTMENT AND OPERATION)

1. Loosen screw ⑧ and adjust the thread shank length by moving guide (large) ⑨ and guide (small) ⑩ in line with the point of needle entry.
2. Set a button (tilt it slightly for easy insertion) and pass the thread as the arrow shows.
3. Set the lengthwise feed "0".
When you sew 16 stitches with Z035, set it "1.5mm" instead of "0".

★ Attachment for snaps (Z007, Z037)

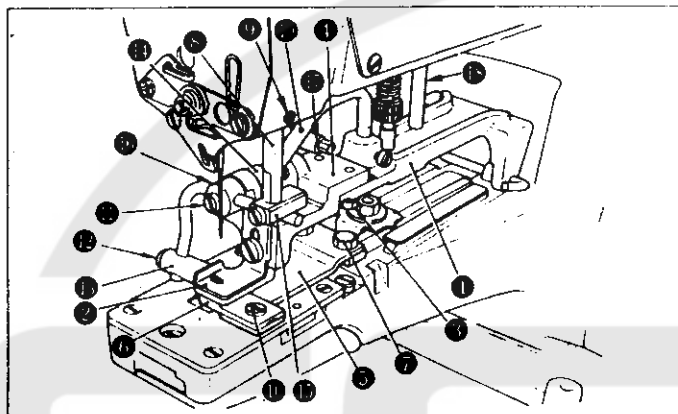


(INSTALLATION)

Remove the button clamp mechanism assembly and the feed plate. Set both the crosswise feed and lengthwise feed graduated plate to "4 mm". Install snap clamp feed plate ① in the way that the needle drops evenly at four corners of its square opening. Install snap attachment assembly ② on the machine, place a snap on the snap clamp jaw levers and make sure that the needle drops accurately in each hole in the snap. If necessary, loosen hex head screws ③ and adjust the position accurately.

Lastly, make sure that the concave section on the bottom face of snap clamp slide guide ④ accurately matches the convex section on snap clamp feed plate ①. Replace thread guide No. 3 ⑤.

★ Attachment for metal buttons (Z008, Z038)



(INSTALLATION)

Remove both the button clamp mechanism assembly and the feed plate from the machine and install attachment ① in place. Loosen screws ③ and adjust button clamp bracket ① to permit the needle to come down in the middle of the needle slot in metal button adaptor ②. Attach button clamp feed plate ⑦ using screws ⑦ in the way that it permits the needle to come down in the middle of the needle slot in feed plate ⑦. Insert the top end of button clamp stud ⑧ into an opening in the jaw of the machine arm and fasten it by screw ⑨.

(ADJUSTMENT AND OPERATION)

1. Loosen screw ⑩, let feed plate ⑦ recedes 1.0 to 1.5 mm from the left end of button clamp jaw lever ② and retighten screw ⑩.
2. Set a button in place, loosen screws ⑪ and ⑫ and align metal button holding clamp ⑬ with the center of the button.

3. Metal button holding clamp ⑬ must give proper pressure to the button so that the button stays steadily in position while being sewn. Loosen a setscrew in thrust collar ⑭ and rotate the thrust collar until metal button holding clamp ⑬ provides proper pressure.
4. You may fix button clamp block ⑮ in a convenient position for operation.

(Caution) 1. When you fix the thrust collar, ensure that button clamp rotating shaft ⑯ does not play axially in its bracket.
2. Adjust lifting hook ④ and stopper pin ⑥ so that L-shaped lifting rod roller ① does not come in contact with button clamp bracket ①.

21. SPECIFICATIONS

	472	473
Sewing speed	Max. 1,500 s.p.m.	
Number of stitches	8, 16 and 32 stitches (6, 12 and 24 by changing the cam)	
Amount of feed	Crosswise feed: 2.5 ~ 6.5 mm Lengthwise feed: 0 ~ 6.5 mm	
Button size	10 ~ 28 mm in diameter	
Needle	TQ x 7, TQ x 1 #14 #16 #18	TQ x 7, TQ x 1, #14 #16 #18

22. MOTOR PULLEY AND BELT

(1) For this machine a single-phase or 3-phase 200 watts (1/4 HP) induction motor is used.

(2) A round leather belt (φ7 x 650 mm) is used.

(3) The sewing speed depends on the diameter of the motor pulley as listed below;

Frequency	Sewing speed	Motor pulley Part No.	Motor pulley outer diameter
50Hz	1,500 s.p.m.	B7101372000	71 mm
	1,250	B7102372000	59.2
60Hz	1,500	B7102372000	59.2
	1,300	B7103372000	51.3

★ The effective diameter of motor pulley is obtained by subtracting 1 mm from its outer diameter.

★ The motor must revolve in the counterclockwise direction when viewed from the motor pulley side. Take care not to let it run in the reverse direction.

23. TROUBLES AND CORRECTIVE MEASURES

TROUBLES	CAUSES	CORRECTIVE MEASURES
1. Thread breakage.	<ol style="list-style-type: none"> (1) The yoke slide does not move in the correct way. (2) The thread tension post No. 2 fails to release the thread at correct timing. (3) The thread nipper catches the thread. (4) The needle does not enter the center of the holes in the button. (5) The needle is too thick for the diameter of the hole in the button. 	<ul style="list-style-type: none"> ○ Adjust the timing of the motion of the yoke slide at each end. ○ Make the thread release timing slightly earlier. ○ Adjust the position of the nipper bar block. ○ Adjust the button clamp jaw lever holder. ○ Replace the needle by a thinner one.
2. Buttons are not sewn tightly.	<ol style="list-style-type: none"> (1) The yoke slide does not move in the correct way. (2) The thread tension post No. 2 fails to release the thread at correct timing. (3) The thread tension post No. 2 does not give sufficient tension. (4) The needle does not enter the center of the holes in the button. (5) The work pressing force is too high or too low. 	<ul style="list-style-type: none"> ○ Adjust the timing of the motion of the yoke slide at each end. ○ Make the thread release timing slightly later. ○ Tighten the tension nut of tension post No. 2. ○ Adjust the button clamp jaw lever holder. ○ Adjust the work pressing force properly.
3. The first stitch trails relatively long thread from the right side of the button.	The thread pull-off lever does not work properly.	<ul style="list-style-type: none"> ○ Adjust the thread pull-off lever by the nipper bar block (rear).
4. Thread trimming failure in the state of stop-motion.	<ol style="list-style-type: none"> (1) The thread tension post No. 2 fails to release the thread at correct timing. (2) The needle hits the edge of the holes in the button. (3) The button clamp assembly does not rise to the necessary height. (4) The thread nipper fails to press the thread. (5) The work pressing force is too high. 	<ul style="list-style-type: none"> ○ Make the thread release timing slightly later to give more tension to the stitches. ○ Adjust the button clamp jaw lever holder. ○ Provide a 12 mm clearance between the feed plate and the button clamp jaw levers when risen. ○ Adjust the nipper bar block. ○ Adjust the work pressing force by the pressure adjusting nut.

ONLY FOR 473

TROUBLES	CAUSES	CORRECTIVE MEASURES
1. Thread trimming failure.	<ol style="list-style-type: none"> (1) The moving knife does not separate the thread on the fabric with its separation nail. (2) The needle does not enter the center of the holes in the button. (3) The last stitch skips. (4) The moving knife separation nail is too high or too low. 	<ul style="list-style-type: none"> ○ Adjust the position of the moving knife. ○ Adjust the button clamp jaw lever holders. ○ Adjust the looper. ○ Adjust the height of the moving knife thread separation nail.
2. The needle thread is cut in two places on the wrong side of the fabric.	<ol style="list-style-type: none"> (1) The moving knife is set in wrong place. (2) The moving knife thread separation nail is too high or too low. 	<ul style="list-style-type: none"> ○ Adjust the position of the moving knife when the machine is in the stop-motion state. ○ Adjust the height of the thread separation nail.
3. Buttons trials too long thread after thread trimming.	<ol style="list-style-type: none"> (1) Timing of the moving knife motion is wrong. (2) The button clamp assembly rises too much. 	<ul style="list-style-type: none"> ○ Adjust the position of the moving knife. ○ Reduce the button clamp lift down to 9 mm.