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Effect of Sewing Work Aid in Garments Production

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Abstract Working aid is an essential part of any Garments Sewing Section. Sewing work aids adversely affect the production and product quality and also help to decrease production cost. The aim of the study was to investigate whether the presence of sewing work aid affects the production of garments and to which extent it affects the production of that garment. In this study, the manufacturing sequence of different types of bottoms, types of machines used for each process, the number of workers used in a sewing line, working hours of the garments, SMV and daily production of those related garments were enlisted and recorded as well. Those data were collected while the garments were manufactured by using work aid and also when those same garments were manufactured in the sewing line without using sewing work aids. As a result, it was concluded that garments production was hugely affected by the use of garment sewing work aid. In addition, this study also demonstrated that the quality of a garment was also affected by the presence of sewing work aid.

Keywords Sewing Work Aid, Machine, SMV, and Production

1. Introduction

The work aids that are used during sewing operations can be categorized in a number of different ways and they vary in the aspect of their overall purpose that they emphasize some otter greatly increased the speed of working in a situation where quality is already satisfactory. Others give a very little improvement in productivity but the great accuracy of sewing. In terms of their function, the commonest ones are used for guiding or folding materials for trimming threads and other components from garments and for stacking the work after sewing. In terms of their method of working some are purely mechanical, some operate Pneumatically, some are photoelectric and some are electronic, some are built into the machine such as a special monitor, some are a variation of a normal machine part such as a special presser foot, and some are a completely separate added part. Guides are used where sewing must take place in a certain position on a garment, usually a certain from a raw edge as in a conventional superimposed where a narrow item such as a lace or braid must be correctly positioned on a garment and where one garment part must be correctly placed on another such as a patch pocket on a shirt skirt or trousers. In their simplest form, they are edge guides, formatting some kind of physical barrier to the fabric being joined together [1] The extra machine parts which may attach to speed up the production and improved quality in the sewing machine are called work aid. [2]

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2. Materials and Method

2.1. Materials

2.1.1. Fabric Selection

For this experiment, 98% cotton & 2% elastic Fabric construction has been selected.

2.1.2. Garment Sewing Work Aid

The term handling is normally used to describe those of those elements that are not sewing and it is this handling along with that dealing with garment bundling where they exist, plus various aspects of machine attention and personal needs, that make up 80 percent of the time spent working by most sewing machinists. The stacking of completed parts by one operator not takes time but may affect the next operator as well. This sewing work aid instrument very much effective for garments production. Such as Plan Guide, guide, Compensating Foot, Stitching Jig, Specialized pressure foot, Light, Folder, Compressed Air, Slack Feeder, Stacker, Latch Back Device and Thread Cutter has been used for this experiment.

2.1.3. Machines

There are different types of machine, Such as Stitch Machine, Flat Lock Machine, Feed of the arm, Bar Tuck Machine, KANSAI Special Sewing Machine, overlock Machine has been used for this experiment.

2.1.4. Types of Equipment

Folder, 1/4Guide, 1/16 Guide, Magnet Guide, T-Guide, piping folder and another Folder has been chosen for this experiment.

Table 1. Experimental Garments sewing operational breakdown and SMV variation for with-sewing work Aid. Various kind of sewing work aids has been used in during garments production

SL	Operation Name	Machine Name	Work Aid	1st Garment						2nd Garment						3rd Garment					
				Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV
				1	2	3				1	2	3				1	2	3			
1	Attach front pocket open facing	OL	Plain guide	40	41	42	41	49	0.82	41	43	44	43	51	0.85	39.8	43.6	43	42.13	50.56	0.84
2	Top stitch front pocket open facing	SNLS	1/16 guide	3	3.1	3.3	3.1	3.76	0.06	4	3.3	3.6	3.47	4.16	0.06	3.7	3.4	3.5	3.533	4.24	0.07
3	OL fly, fly box , front rise	OL	Plain guide	20	20	20	20	24.1	0.40	20	21	19	20	24	0.4	18.7	20.4	19	19.37	23.24	0.39
4	Attach front pocket facing to bag	SNLS	1/16 guide	30	29	2	29	35.3	0.58	29	29	29	29	34.8	0.58	29	29.3	29.6	29.3	35.16	0.59
5	Attach front pkt bag to open	SNLS	Plain guide	25	26	24	23	30.0	0.50	25	23.	25	24.	29.1	0.48	24.3	25.2	24.2	24.57	29.48	0.49
6	Edge stitch front pocket open	SNLS	1/16 guide	33	34	35	34	40.8	0.68	32	35	34	33	40.6	0.67	34.8	35.6	37.4	35.93	43.12	0.72
7	Top stitch front pocket open	SNLS		33	34	33	33	40.1	0.66	34	34	33	33	40.4	0.67	33.7	32	34.5	33.4	40.08	0.67
8	Attaching tuck side and waist	SNLS	Plain guide	27	29	30	28	34.6	0.57	28	29	33	29.	35.6	0.59	28.2	30.4	31.6	30.07	36.08	0.6
9	Close front pocket bag	O/L	Plain guide	32	31	31	33	37.7	0.62	34	3.	33	33	40.4	0.67	35	33.4	32.1	33.5	40.2	0.67
10	Top stitch front pocket bag	SNLS	1/4 guide	33	32	31	31.	38.2	0.63	31	33.	33	32.	38.7	0.64	31	31.4	32.3	31.57	37.88	0.63
11	Attach fly and edge stitch	SNLS	1/6 guide	24	24	25	23	29.	0.48	25	26	24	25	30.3	0.505	27	24.7	26.3	26	31.2	0.52

SL	Operation Name	Machine Name	Work Aid	1st Garment						2nd Garment						3rd Garment					
				Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV
				1	2	3				1	2	3				1	2	3			
12	Zipper attach	DNLS	Plain guide	33	35	36	35	42	0.70	33	35	36	34	41.2	0.688	33	34.8	35.2	34.33	41.2	0.69
13	J-stitch	SNLS	Plain guide	42	42	43	43	52.4	0.87	41	42	43	42	50.8	0.847	44.5	40	42.6	42.37	50.84	0.85
14	Fly box attach & top stitch	SNLS	Plain guide	43	42	40	41	49.9	0.83	42	40	43	41	50.2	0.837	42.6	42	43.3	42.63	51.16	0.85
15	Tuck front rise	SNLS	Magnet guide	51	54	53	52	63.3	1.05	52	52	53	52	62.7	1.045	53.2	55	53.6	53.93	64.72	1.08
16	Top stitch front rise	SNLS	1/4 guide	10	11	11.2	10	12.7	0.21	11	12.	11	11	13.9	0.233	12.5	11.2	10.8	11.5	13.8	0.23
17	Make back pocket dart	SNLS		65	65	70	66	80.1	1.33	66	68	68	67	80.7	1.346	67.7	65.5	70.4	67.87	81.44	1.36
18	Back pocket hem	DNLS		43.	44	45	44	52.8	0.88	42	44	43	43	52	0.867	44.4	42.7	40.7	42.6	51.12	0.85
19	Over lock back pocket & coin pocket	OL	Plain guide	30.7	30	29	29	35.8	0.59	29	29.	31	29.	35.3	0.589	29.5	28.4	30.4	29.43	35.32	0.59
20	Attach back yoke	FOA	Folder	53	54	55	54	65	1.08	55	54	56	55	65.9	1.099	53.8	54	54.9	54.23	65.08	1.08
21	Attach back rise	FOA	Folder	90.5	90	89	90	108.2	1.80	90	90	90	90	108	1.801	91.2	90.4	90	90.53	108.64	1.81
22	Iron back pocket	IRON		53.5	52	54.8	53.5	64.24	1.071	56	54	54	54.4	65.24	1.087	55.5	53.1	53.7	54.1	64.92	1.08
23	Mark back pocket attach	HP		40	39	39	39.2	47.12	0.785	39	41	40	39.7	47.64	0.794	38.5	40.4	39.7	39.53	47.44	0.79
24	Attach back pocket with level	SNLS		13	12	12.2	12.36	14.84	0.247	12	12	12	11.8	14.12	0.235	12	11.4	12.7	12.03	14.44	0.24
25	Set front & back part	HP		32.3	31	32.4	31.9	38.28	0.638	33	33.7	31	32.7	39.24	0.654	32	31.5	32.8	32.1	38.52	0.64
26	Tuck in	SNLS	Plain	24	24	23.7	23.9	28.76	0.479	23	24.7	24	24	28.84	0.481	25.5	23.6	24.8	24.63	29.56	0.49

SL	Operation Name	Machine Name	Work Aid	1st Garment						2nd Garment						3rd Garment					
				Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV
				1	2	3				1	2	3				1	2	3			
	seam		guide																		
27	Inseam over lock	O/L	Plain guide	35.4	33	34	34.2	41.12	0.685	36	34.1	34	34.6	41.48	0.691	34.5	34.4	35	34.63	41.56	0.69
28	Top stitch inseam	FOA	Folder	74.2	73	73.4	73.5	88.24	1.471	74	73.2	76	74.5	89.36	1.489	75.3	74.3	75.8	75.13	90.16	1.5
29	Tuck side seam	SNLS	Plain guide	15.4	15	15	15	18	0.3	16	13.3	15	14.5	17.36	0.289	14.3	15.5	16	15.27	18.32	0.31
30	Safety stitch side seam	SNLS	Plain guide	3.1	2.8	2.9	2.93	3.52	0.059	3	3	2.7	2.83	3.4	0.057	3.1	2.9	2.6	2.867	3.44	0.06
31	Hip stitch	SNLS	1/16 guide	44.5	44	44.6	44.3	53.16	0.886	46	44.2	45	45	53.96	0.899	43.8	44.5	45.7	44.67	53.6	0.89
32	Attach wash & care level	SNLS		43.2	42	44.6	43.2	51.92	0.865	44	45	46	45	54	0.9	44.7	45	45.5	45.07	54.08	0.9
33	Loop seas or & mark waistband	HP		76.4	75	77	76.2	91.48	1.525	76	74.3	74	74.6	89.48	1.491	74	75.5	74.6	74.7	89.64	1.49
34	loop attach	HP		76.3	74	77.5	75.9	91.12	1.519	77	73.6	76	75.5	90.56	1.509	75	76.1	75.4	75.5	90.6	1.51
35	Iron waistband	IRON		54	56	53.2	54.5	65.4	1.09	53	55.4	54	54.2	65	1.083	54.7	56.3	55	55.33	66.4	1.11
36	Iron coin pocket + inner loop	IRON		31.2	33	33.1	32.3	38.8	0.647	33	31.4	34	32.5	39	0.65	32.3	34.6	33.2	33.37	40.04	0.67
37	Waistband matching with body	HP		44	43	45.7	44.3	53.16	0.886	43	44.5	45	44.2	53.04	0.884	42	43.6	42.8	42.8	51.36	0.86
38	Inner waistband ends tuck	SNLS		73.5	74	75.1	74.2	89.12	1.485	75	73.5	75	74.7	89.6	1.493	76.4	75.3	77.2	76.3	91.56	1.53
39	Top stitch	SNLS	Plane guide	73.6	76	77	75.6	90.76	1.513	80	78.1	77	78.1	93.68	1.561	78	77.7	76.4	77.37	92.84	1.55
39	waistband		Plane guide	27	29	29.3	28.3	34.04	0.567	28	27	27	27.4	32.88	0.548	28.2	27.3	29.5	28.33	34	0.57

SL	Operation Name	Machine Name	Work Aid	1st Garment						2nd Garment						3rd Garment					
				Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV
				1	2	3				1	2	3				1	2	3			
40	Up Attach waistband	SNLS		76.4	78	75.1	76.6	91.92	1.532	76	77.4	76	76.4	91.72	1.529	79	80.3	78.5	79.27	95.12	1.59
41	Top stitch waist band up	SNLS	1/16 guide	44.2	44	45.8	44.5	53.44	0.891	45	45.6	43	44.7	53.6	0.893	44.5	46	42.7	44.4	53.28	0.89
42	Attach	SNLS	1/4 guide	43.5	45	45.5	44.5	53.44	0.891	44	43.5	43	43.5	52.2	0.87	42.6	44	43.5	43.37	52.04	0.87
43	False tuck waist band	SNLS	Plain guide	44.2	45	44.3	44.6	53.52	0.892	45	44.4	45	44.9	53.84	0.897	44.1	43.6	45	44.23	53.08	0.88
44	Waistband ends scissors	HP		33.3	33	34.6	33.5	40.2	0.67	34	31.8	35	33.5	40.24	0.671	32.3	32.1	33.5	32.63	39.16	0.65
45	Waistband ends open stitch	HP		75.8	76	74.3	75.4	90.56	1.509	76	75.3	78	76.4	91.72	1.529	75.7	74.9	76	75.53	90.64	1.51
46	Waist band end inner close	SNLS	Plain guide	32	33	34.6	33.3	40	0.667	33	34.5	36	34.7	41.64	0.694	33.2	32.6	34	33.27	39.92	0.67
47	Waist band end close top side	SNLS	1/16 guide	44.4	45	46.7	45.4	54.48	0.908	45	45.5	42	43.9	52.72	0.879	44.2	45.5	44.7	44.8	53.76	0.9
48	Waist band end close 2nd stitch	SNLS	Hanger guide	33.1	32	33.5	32.8	39.44	0.657	32	34.3	35	33.6	40.32	0.672	32.6	33.5	34.6	33.57	40.28	0.67
49	Bottom hem	SNLS	T guide	44.2	43	44.6	43.9	52.72	0.879	42	44.7	45	44	52.8	0.88	45	45.5	46.4	45.63	54.76	0.91
50	Attach coin pocket	SNLS	1/16 guide	32.4	33	31.9	32.3	38.8	0.647	34	35	33	33.8	40.52	0.675	31.5	33	32.9	32.47	38.96	0.65
51	Loop truck up & down	BT		46.6	44	43.6	44.7	53.68	0.895	45	44.5	44	44.5	53.36	0.889	45.5	46	47.3	46.27	55.52	0.93
Total										***43.2***					***43.3***					***43.6***	

Source: Data collected from Ananta Garment Ltd.-2016

Table 2. Experimental Garments sewing operational breakdown and SMV variation for without sewing work Aid. Any kind of sewing work aids has not been used in during garments production

SL#	Operation Name	Machine Name	1st Garment						2nd Garment						3rd Garment					
			Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV
			1	2	3				1	2	3				1	2	3			
1	Attach front pocket open facing	OL	48.3	49.5	48..3	48.9	58.68	0.978	51	49	48.7	49	59.3	0.988	49.8	48.6	47.2	48.5	58.24	0.9707
2	Top stitch front pocket open facing	SNLS	12.3	15.3	14	13.9	16.68	0.278	13.3	16	15.1	15	17.6	0.293	15.4	14.5	13.4	14.4	17.32	0.2887
3	OL fly, fly box, front rise	OL	30.5	29.8	30	30	36	0.6	31.3	29	28.4	30	35.5	0.592	31.3	28.7	30.4	30.1	36.16	0.6027
4	Attach front pocket facing to bag	SNLS	30	29	29	29.4	35.32	0.5887	29	29	28.7	29	34.8	0.58	30	29	29.3	29.4	35.32	0.5887
5	Attach front pocket bag to open	SNLS	25	35.5	33	31.3	37.52	0.6253	34.7	34	34.5	34	41.2	0.686	36.3	37.7	34.3	36.1	43.32	0.722
6	Edge stitch front pocket open	SNLS	40	46.5	43	43.2	51.8	0.8633	45	44	46.4	45	54.3	0.905	41.5	44.8	45.6	44	52.76	0.8793
7	Top stitch front pocket open	SNLS	43	44	43	43.5	52.16	0.8693	45.5	44	44	45	53.5	0.891	43.7	42	44.5	43.4	52.08	0.868
8	Attaching tuck side and waist	SNLS	38	37	49	41.3	49.6	0.8267	39	43	44.2	42	50.3	0.838	38.2	40.4	41.6	40.1	48.08	0.8013
9	Close front pocket bag	O/L	38.5	46	42	42.2	50.6	0.8433	44	45	42.5	44	52.4	0.873	45	43.4	42.1	43.5	52.2	0.87
10	Top stitch front pocket bag	SNLS	39.3	42	43	41.5	49.8	0.83	43.6	45	42.8	44	52.4	0.874	44	42.3	43	43.1	51.72	0.862
11	Attach fly and edge stitch	SNLS	34	33.7	35	34.3	41.2	0.6867	38.5	35	36.1	37	43.8	0.731	34.7	38.3	36.3	36.4	43.72	0.7287
12	Zipper attach	DNLS	45.3	46.2	46	45.8	55	0.9167	42.5	45	45.7	44	53.3	0.888	44.8	45.2	42.9	44.3	53.16	0.886

SL#	Operation Name	Machine Name	1st Garment						2nd Garment						3rd Garment					
			Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV
			1	2	3				1	2	3				1	2	3			
13	J-stitch	SNLS	55.3	52.3	54	53.7	64.44	1.074	51.3	59	52.8	54	65	1.084	48.3	54.7	52.6	51.9	62.24	1.0373
14	Fly box attach & top stitch	SNLS	53.2	51.5	50	51.6	61.92	1.032	50.2	53	55	53	63.4	1.057	53.3	55.5	56	54.9	65.92	1.0987
15	Tuck front rise	SNLS	57.5	63	59	59.8	71.8	1.1967	62	58	63.2	61	73.3	1.221	65	63.6	62	63.5	76.24	1.2707
16	Top stitch front rise	SNLS	19	20.6	21	20.3	24.32	0.4053	22.5	21	20.8	22	25.9	0.431	20.8	21.6	19.7	20.7	24.84	0.414
17	Make back pocket dart	SNLS	84.3	80	82	81.9	98.32	1.6387	78	78	75.4	77	92.4	1.539	80.4	81	78.3	79.9	95.88	1.598
18	Back pocket hem	DNLS	55	54.3	53	54.1	64.96	1.0827	54.6	55	53.1	54	65.1	1.085	50.7	53	54.5	52.7	63.28	1.0547
19	Over lock back pocket & coin pocket	OL	39.2	41.4	40	40.2	48.24	0.804	38.5	39	40.5	39	47.3	0.789	38.4	39.5	40.4	39.4	47.32	0.7887
20	Attach back yoke	FOA	64.3	65.2	65	64.8	77.8	1.2967	64	66	63	64	77	1.284	66.7	64.9	65.5	65.7	78.84	1.314
21	Attach back rise	FOA	99.8	99.4	98	99.1	118.88	1.9813	98.5	99	99.5	99	119	1.985	99.2	98.5	99	98.9	118.7	1.978
22	Iron back pocket	IRON	63.5	62.3	65	63.5	76.24	1.2707	65.5	64	63.6	64	77.2	1.287	65	65.5	63.1	64.5	77.44	1.2907
23	Mark back pocket attach	HP	48.8	49	50	49.4	59.24	0.9873	48.5	51	49.6	50	59.6	0.994	48.5	50.4	49.7	49.5	59.44	0.9907
24	Attach back pocket with level	SNLS	23	21.9	22	22.4	26.84	0.4473	21.5	22	21.8	22	26.1	0.435	21	22	21.4	21.5	25.76	0.4293
25	Set front & back part	HP	42.4	43.7	42	42.7	51.24	0.854	43.3	44	41.1	43	51.2	0.854	42	41.5	42.8	42.1	50.52	0.842
26	Tuck in seam	SNLS	34.2	33.7	33	33.6	40.32	0.672	33.4	33	34.7	34	40.2	0.671	32	32.1	33.6	32.6	39.08	0.6513
27	Inseam over lock	O/L	44	42.8	44	43.5	52.2	0.87	45.8	44	43.8	45	53.5	0.891	44.5	44.4	44.5	44.5	53.36	0.8893
28	Top stitch inseam	FOA	84.2	83	83	83.5	100.24	1.6707	84	83	86.2	84	101	1.689	85.3	84.3	85.8	85.1	102.2	1.7027

SL#	Operation Name	Machine Name	1st Garment						2nd Garment						3rd Garment					
			Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV
			1	2	3				1	2	3				1	2	3			
29	Tuck side seam	SNLS	25	24.9	24	24.7	29.68	0.4947	23.3	25	22.3	23	28	0.467	24.3	25.5	26	25.3	30.32	0.5053
30	Safety stitch side seam	SNLS	4.8	4.9	5	4.9	5.88	0.098	4.7	5	4.6	4.7	5.6	0.093	5.1	4.9	4.6	4.87	5.84	0.0973
31	Hip stitch	SNLS	54.6	55.1	55	54.8	65.8	1.0967	55.2	53	54.8	54	65.2	1.087	53.8	54.5	55.7	54.7	65.6	1.0933
32	Attach wash & care level	SNLS	53.2	52	55	53.3	63.92	1.0653	55.6	53	51.2	53	64	1.067	53.6	54.7	55	54.4	65.32	1.0887
33	Loop seas or & mark waist band	HP	87	88.3	86	87.1	104.56	1.7427	85.6	84	83.8	85	101	1.691	87.3	84	85.5	85.6	102.7	1.712
34	loop attach	HP	86.3	87.5	88	87.4	104.84	1.7473	84	87	83.6	85	102	1.695	86.1	83.9	85.4	85.1	102.2	1.7027
35	Iron waist band	IRON	63.2	64.4	65	64.2	77.08	1.2847	65.4	64	64.2	65	77.5	1.291	64.7	66.3	65	65.3	78.4	1.3067
36	Iron coin pocket + inner loop	IRON	41.2	42.7	43	42.3	50.8	0.8467	42.5	41	43.6	43	51	0.85	44.6	43.2	45	44.3	53.12	0.8853
37	Waist band matching with body	HP	54	53.2	56	54.3	65.16	1.086	50.2	53	54.5	53	63.1	1.052	52	53.6	52.8	52.8	63.36	1.056
38	Inner waist band end tuck	SNLS	83.5	84.2	85	84.3	101.12	1.6853	85.4	84	85.1	85	102	1.693	86.4	85.3	87.2	86.3	103.6	1.726
39	Top stitch	SNLS	83.6	86.3	87	85.6	102.76	1.7127	89.5	88	86.6	88	106	1.761	86.4	85.3	88	86.6	103.9	1.7313
39	waistband		35	36	39	36.8	44.12	0.7353	36.8	36	38.1	37	44.2	0.737	39.5	34.9	35.5	36.6	43.96	0.7327
40	Up Attach waist band	SNLS	86.4	88.3	85	86.6	103.92	1.732	85.6	87	86.3	86	104	1.729	88.5	87.2	86.6	87.4	104.9	1.7487
41	Top stitch waist band up	SNLS	54.2	53.6	56	54.5	65.44	1.0907	55	56	53.4	55	65.6	1.093	52.7	55	56.2	54.6	65.56	1.0927
42	Attach	SNLS	55.1	52	54	53.5	64.24	1.0707	54	54	53	54	64.2	1.07	53.5	55.5	54.3	54.4	65.32	1.0887
43	False tuck waist band	SNLS	54.2	55.3	54	54.6	65.52	1.092	55	54	55.2	55	65.8	1.097	54.1	53.6	55	54.2	65.08	1.0847
44	Waist band	HP	42	45.2	43	43.5	52.2	0.87	41.5	44	45.6	44	52.4	0.874	42.3	42.1	43.5	42.6	51.16	0.8527

SL#	Operation Name	Machine Name	1st Garment						2nd Garment						3rd Garment					
			Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV	Observation Time (sec)			Avg.	With 20% Allowance	SMV
			1	2	3				1	2	3				1	2	3			
	end scissors																			
45	Waist band end open stitch	HP	84	85.8	86	85.4	102.44	1.7073	86.4	85	87.6	86	104	1.729	85.7	84.9	86	85.5	102.6	1.7107
46	Waist band end inner close	SNLS	42	43.2	43	42.9	51.44	0.8573	46.2	43	44.7	45	53.7	0.895	42.6	47	44	44.5	53.44	0.8907
47	Waist band end close top side	SNLS	54.4	55.1	57	55.4	66.48	1.108	55.5	52	51.3	53	63.4	1.057	55	55.5	54.7	55.1	66.08	1.1013
48	Waist band end close 2nd stitch	SNLS	43.1	42	44	42.9	51.44	0.8573	44.5	46	41.8	44	52.9	0.882	47.3	43.5	44.6	45.1	54.16	0.9027
49	Bottom hem	SNLS	54.2	53	55	53.9	64.72	1.0787	54.7	55	56.2	55	66.5	1.108	56.4	53.9	54.6	55	65.96	1.0993
50	Attach coin pocket	SNLS	42.4	42.7	42	42.3	50.8	0.8467	43.7	43	44.5	44	52.3	0.872	42.9	41.6	42.6	42.4	50.84	0.8473
51	Loop tuck up & down	BT	53.6	54.3	53	53.6	64.36	1.0727	55.2	55	55.5	55	66.1	1.101	55.5	53.5	54.7	54.6	65.48	1.0913
Total							53.168						53.43							53.566

Source: Data collected from Ananta Garment Ltd.-2016

2.2. Method

2.2.1. Calculation of SAM or SMV through Time Study

Step 1: Select one operation for which you want to calculate SAM.

Step 2: Take one stopwatch. Stand by the side of the operator. Capture cycle time for that operation. (Cycle time – total time is taken to do all works needed to complete one operation, i.e. time from pick up part of the first piece to next pick up of the next piece) [3, 4]. Convert this cycle time into basic time by multiplying cycle time with operator performance rating. [Basic Time = Cycle Time X performance Rating]

Step 3: Step 3: Performance rating. Now you have to rate the operator at what performance level he was doing the job seeing his movement and work speed. Suppose that operator performance rating is 80%. Suppose cycle time is 0.59 minutes. Basic time = (0.59 X 80%) = 0.472 minutes.

Step 4: Standard allowed minutes (SAM) = (Basic minute + Bundle allowances + machine and personal allowances). Add bundle allowances (10%) and machine and personal allowances (20%) to basic time [4].

To convert cycle time to normal or basic time needs to multiply it with operator performance rating. Now allowances for machine, fatigue and personal needs etc have been added. Machine allowance only to those elements where the machine is running, fatigue and personal needs to all elements are added. Finally, standard time for each element in seconds is found by summing up all elemental time and then seconds is converted into minutes. This is known as Standard Minute Value (SMV). [5]

3. Result and Discussion

Table 3 shows the total SMV taken for each garment to complete the process of operation.

Table 3. Variations of SMV for with sewing work aid and without sewing work aid in Sewing Section for Different Styles

Style No	SMV(min) Value		Variation of SAM (A-B)= (C)
	With sewing Work Aid (A)	Without sewing Work Aid (B)	
1st Garment	43.2	53.16	9.96
2nd Garment	43.3	53.43	10.13
3rd Garment	43.6	53.56	9.96

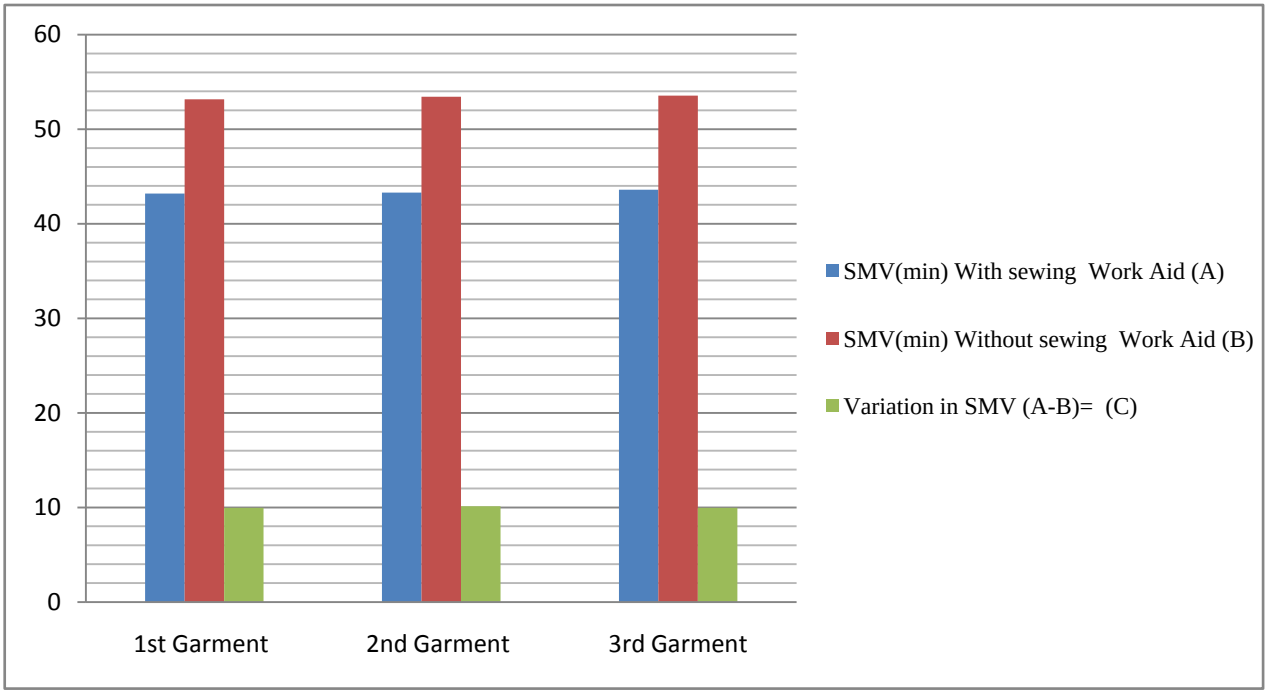

Diagram 1. Comparison of Style wise SMV variation of with and without sewing work aid

From the above diagram 1, it is seen that SMV of the 1st Garment of 1st style produced using sewing work aid and without using sewing work aid. As a result, the 1st garment of SMV is lower than the same garment produced without using work aid. The matter is same for both 2nd garment and 3rd garment.

From the table 4, it is seen that Sewing works aid production higher than without sewing work aid production.

Observed Garment No.	No. of Operator	Working Hours	Calculated Production		Difference	Average
			With sewing Work Aid	Without sewing Work Aid		
1st	60	8	667	542	125	124
2nd	60	8	664	539	125	
3rd	60	8	661	538	124	

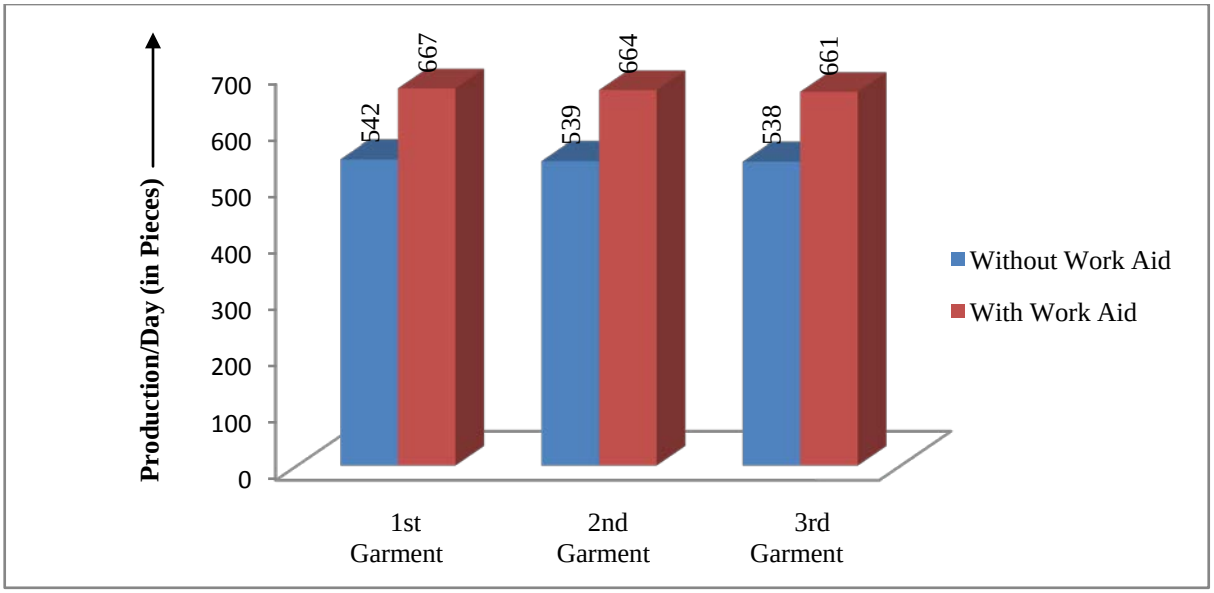

Diagram 2. Comparison of Production Per Day with and without Work Aid

From the above diagram, it is seen that SMV of the 1st Garment of 1st style produced using work aid is lower than the same garment produced without using work aid. As a result, the calculated production of the 1st garment of 1st style is higher than the same garment produced without using work aid. The matter is same for both garment 2 and garment 3 of 1st style. The difference of daily production with and without using work aid was 124 on an average which was huge. Work aid ensures a better quality and increase the productivity of a garment manufacturing process Step.

4. Conclusions

Working aid is an important and essential part of any Garments Industry. Working Aid is one of the most effective sewing tools. In the domestic production of garments, 50% of the time is wasted for the handling of fabric. Other 50% used for sewing. To reduce this wastage in industrial production of garments work aids required. These work aids are not only used to reduce the handling time but also used to improve the quality of the garments. The extent of process control in maintaining the processing parameters at desired level can be reduced thereby maintaining quality & increasing productivity. For this purpose, this research project will be very helpful.

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