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(54) **IMAGE PROCESSING SYSTEM, ANALYZING APPARATUS, AND RECORDING MEDIUM**

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A61B 5/00 (2006.01)

(52) **U.S. Cl.**

CPC ***G06F 3/1217*** (2013.01); ***A61B 5/0022*** (2013.01); ***G06F 3/1203*** (2013.01)

(57) **ABSTRACT**

An image processing system includes an acquiring section that acquires biological information on a user who makes an image processing apparatus execute a job and operation information on the image processing apparatus with the biological information changing depending on a state of the user, an analysis section that analyzes stress of the user concerning use of the image processing apparatus, based on the biological information and the operation information, and an output section that outputs an analysis result obtained by the analysis section.

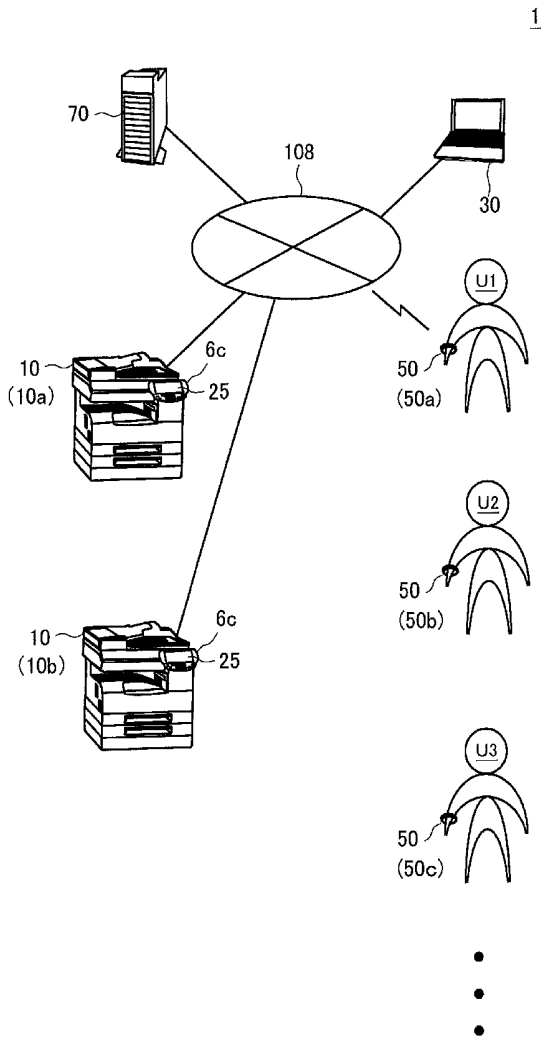

Fig.1

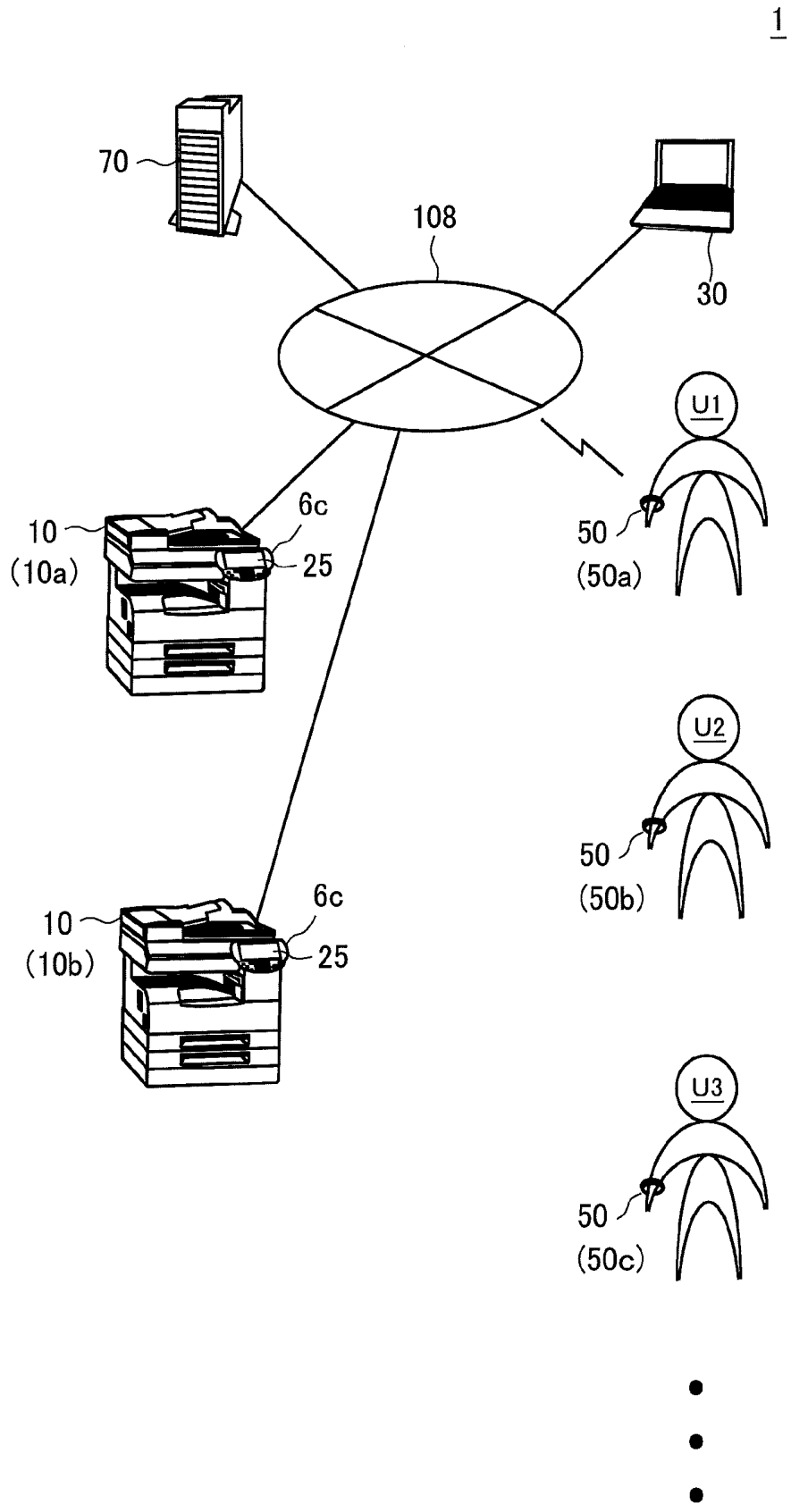

Fig.2

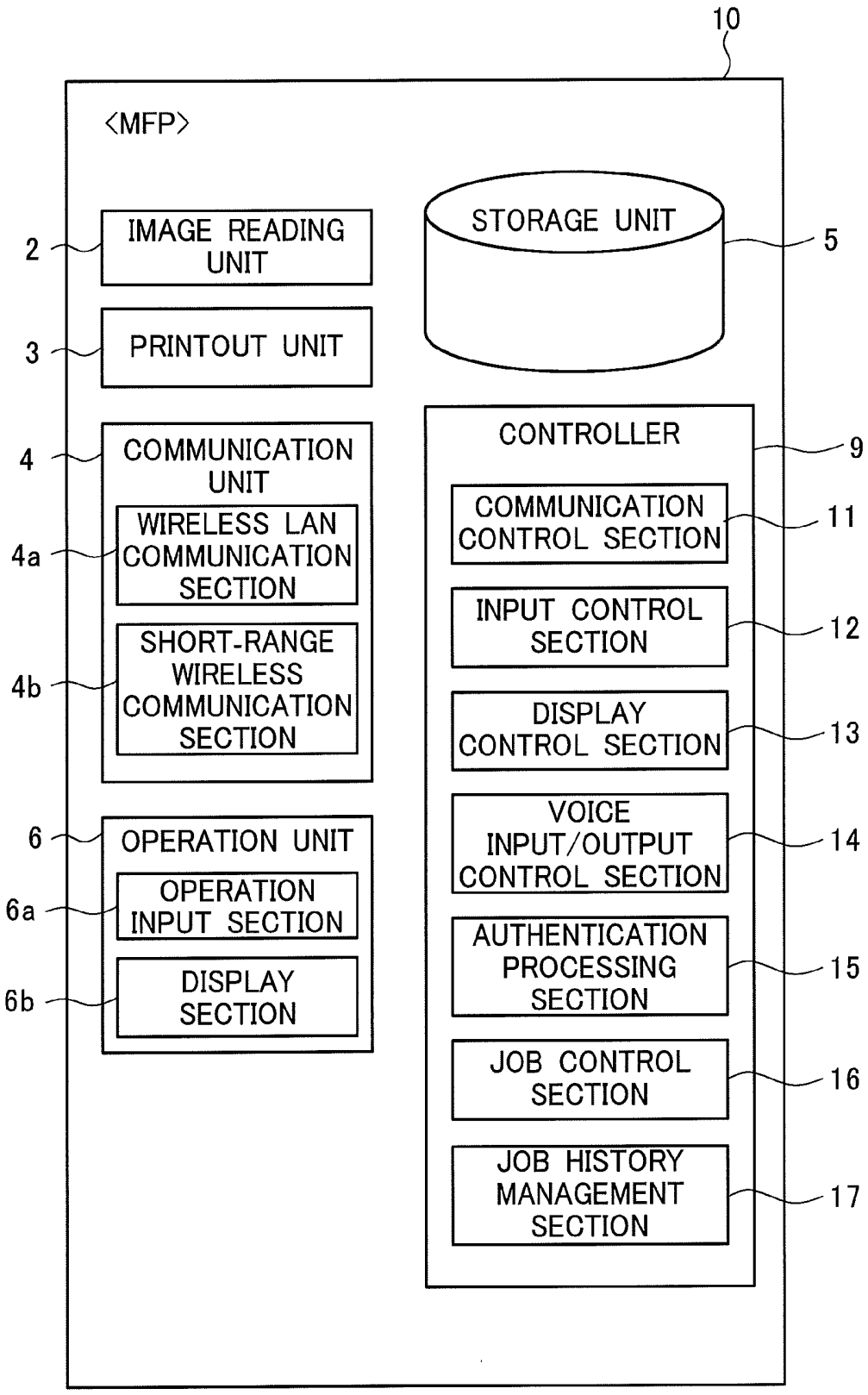
10
<MFP>
2
IMAGE READING UNIT
3
PRINTOUT UNIT
4
COMMUNICATION UNIT
4a
WIRELESS LAN COMMUNICATION SECTION
4b
SHORT-RANGE WIRELESS COMMUNICATION SECTION
6
OPERATION UNIT
6a
OPERATION INPUT SECTION
6b
DISPLAY SECTION
STORAGE UNIT
5
CONTROLLER
9
COMMUNICATION CONTROL SECTION
11
INPUT CONTROL SECTION
12
DISPLAY CONTROL SECTION
13
VOICE INPUT/OUTPUT CONTROL SECTION
14
AUTHENTICATION PROCESSING SECTION
15
JOB CONTROL SECTION
16
JOB HISTORY MANAGEMENT SECTION
17

Fig.3

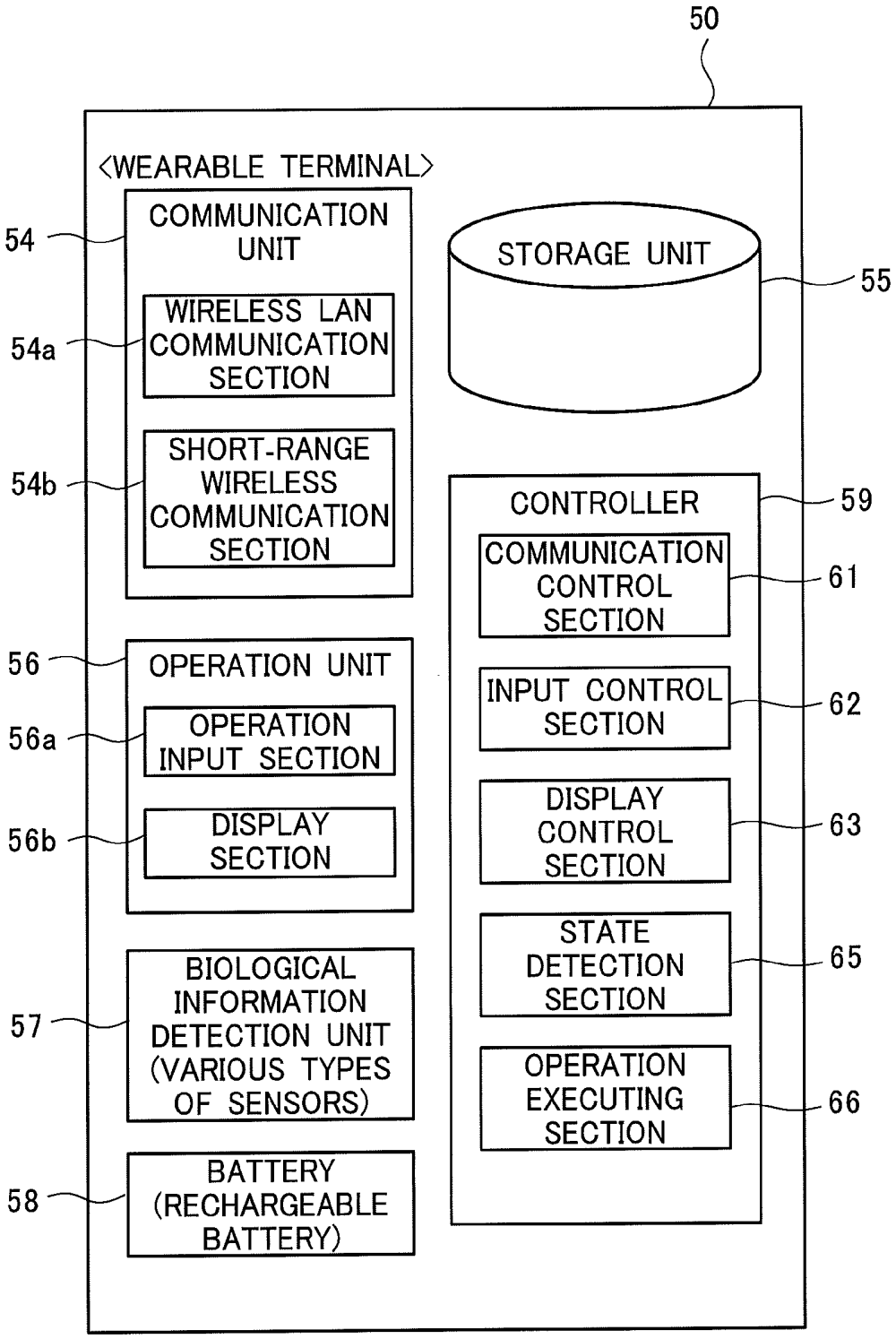
50
<WEARABLE TERMINAL>
54
COMMUNICATION UNIT
54a
WIRELESS LAN COMMUNICATION SECTION
54b
SHORT-RANGE WIRELESS COMMUNICATION SECTION
56
OPERATION UNIT
56a
OPERATION INPUT SECTION
56b
DISPLAY SECTION
57
BIOLOGICAL INFORMATION DETECTION UNIT (VARIOUS TYPES OF SENSORS)
58
BATTERY (RECHARGEABLE BATTERY)
STORAGE UNIT
55
CONTROLLER
59
COMMUNICATION CONTROL SECTION
61
INPUT CONTROL SECTION
62
DISPLAY CONTROL SECTION
63
STATE DETECTION SECTION
65
OPERATION EXECUTING SECTION
66

Fig.4

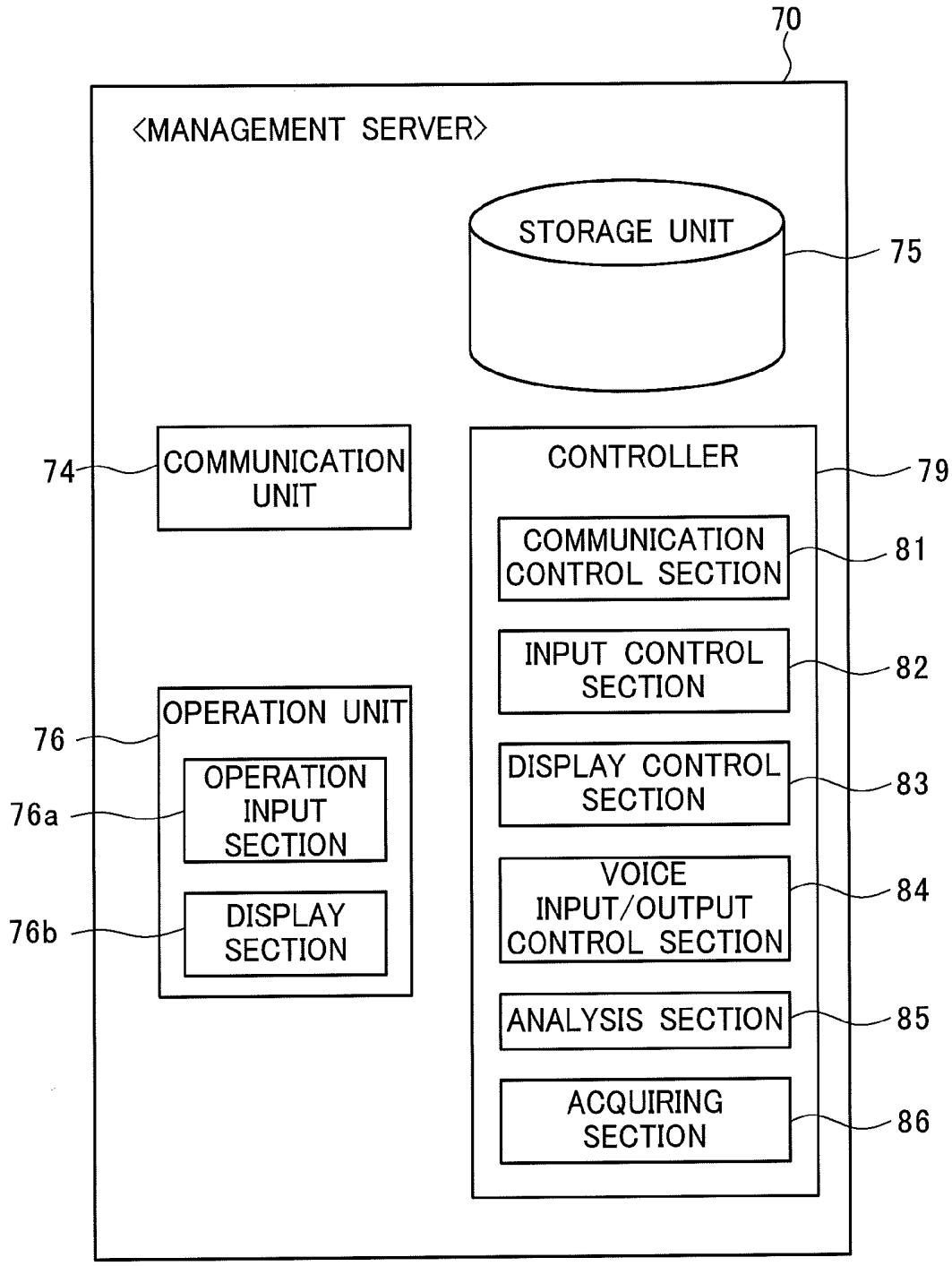
70
<MANAGEMENT SERVER>
STORAGE UNIT
75
74
COMMUNICATION UNIT
CONTROLLER
79
COMMUNICATION CONTROL SECTION
81
INPUT CONTROL SECTION
82
OPERATION UNIT
76
DISPLAY CONTROL SECTION
83
76a
OPERATION INPUT SECTION
VOICE INPUT/OUTPUT CONTROL SECTION
84
76b
DISPLAY SECTION
ANALYSIS SECTION
85
ACQUIRING SECTION
86

Fig.5

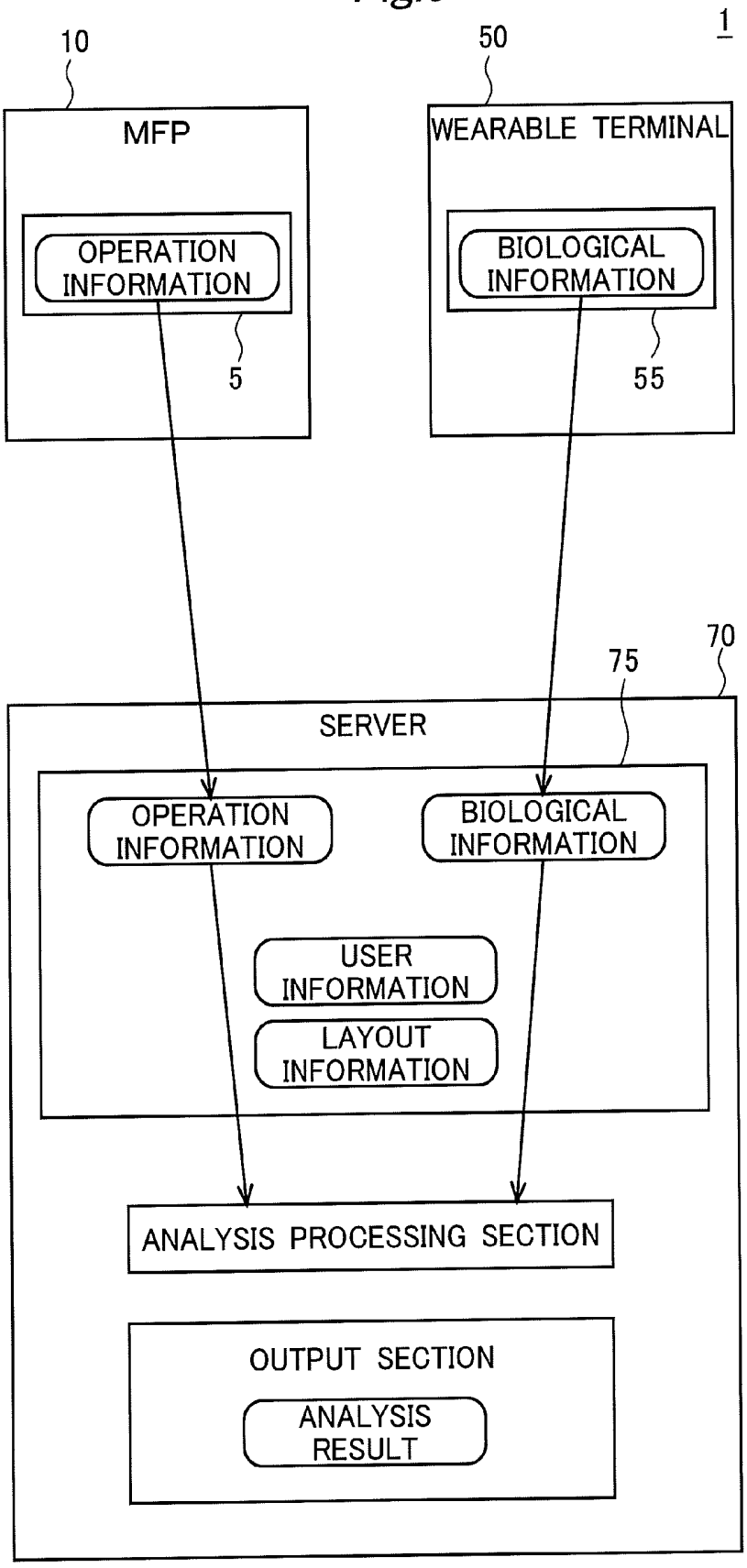
10
50
1
MFP
WEARABLE TERMINAL
OPERATION INFORMATION
BIOLOGICAL INFORMATION
5
55
70
75
SERVER
OPERATION INFORMATION
BIOLOGICAL INFORMATION
USER INFORMATION
LAYOUT INFORMATION
ANALYSIS PROCESSING SECTION
OUTPUT SECTION
ANALYSIS RESULT

Fig.6

No	USER NAME	MFP NAME	TYPE OF JOB	LOGIN TIME	JOB START TIME	JOB END TIME	LOGOUT TIME
1	USER U1	MFP_A	COPY	2016/3/1 10:00	2016/3/1 10:01	2016/3/1 10:04	2016/3/1 10:09
2	USER U1	MFP_A	COPY	2016/3/1 10:59	2016/3/1 11:01	2016/3/1 11:03	2016/3/1 11:15
3	USER U1	MFP_A	COPY	2016/3/1 10:59	2016/3/1 11:05	2016/3/1 11:10	2016/3/1 11:15
4	USER U1	MFP_B	COPY	2016/3/1 11:29	2016/3/1 11:31	2016/3/1 11:33	2016/3/1 11:38
5	USER U1	MFP_B	COPY	2016/3/1 11:55	2016/3/1 11:56	2016/3/1 11:57	2016/3/1 12:02
6	USER U1	MFP_A	COPY	2016/3/1 15:07	2016/3/1 15:08	2016/3/1 15:12	2016/3/1 15:17
7	USER U1	MFP_B	COPY	2016/3/2 10:20	2016/3/2 10:21	2016/3/2 10:25	2016/3/2 10:30
8	USER U1	MFP_B	COPY	2016/3/2 13:00	2016/3/2 13:01	2016/3/2 13:03	2016/3/2 13:08
9	USER U1	MFP_A	COPY	2016/3/2 13:35	2016/3/2 13:38	2016/3/2 13:40	2016/3/2 13:48
10	USER U1	MFP_A	COPY	2016/3/2 13:35	2016/3/2 13:41	2016/3/2 13:43	2016/3/2 13:48

Fig.7

No	USER NAME	MFP NAME	TYPE OF JOB	MFP USE START TIME	MFP USE END TIME
1	USER U1	MFP_A	COPY	2016/3/1 10:00	2016/3/1 10:09
2	USER U1	MFP_A	COPY	2016/3/1 10:59	2016/3/1 11:15
3	USER U1	MFP_A	COPY	2016/3/1 10:59	2016/3/1 11:15
4	USER U1	MFP_B	COPY	2016/3/1 11:29	2016/3/1 11:38
5	USER U1	MFP_B	COPY	2016/3/1 11:55	2016/3/1 12:02
6	USER U1	MFP_A	COPY	2016/3/1 15:07	2016/3/1 15:17
7	USER U1	MFP_B	COPY	2016/3/2 10:20	2016/3/2 10:30
8	USER U1	MFP_B	COPY	2016/3/2 13:00	2016/3/2 13:08
9	USER U1	MFP_A	COPY	2016/3/2 13:35	2016/3/2 13:48
10	USER U1	MFP_A	COPY	2016/3/2 13:35	2016/3/2 13:48

Fig.8

(USER U1)

	No1		
	DATE	TIME SEC.	BLOOD PRESSURE
T0	2016/3/1	9:59 00	116
	2016/3/1	9:59 30	118
T1	2016/3/1	10:00 00	116
	2016/3/1	10:00 30	119
	2016/3/1	10:01 00	116
T2	2016/3/1	10:01 30	119
	2016/3/1	10:02 00	117
	2016/3/1	10:02 30	119
	2016/3/1	10:03 00	125
	2016/3/1	10:03 30	133
	2016/3/1	10:04 00	135
T3	2016/3/1	10:04 30	132
	2016/3/1	10:05 00	131
	2016/3/1	10:05 30	126
	2016/3/1	10:06 00	121
	2016/3/1	10:06 30	122
	2016/3/1	10:07 00	123
	2016/3/1	10:07 30	119
	2016/3/1	10:08 00	125
	2016/3/1	10:08 30	121
	2016/3/1	10:09 00	115
T4	2016/3/1	10:09 30	118
	2016/3/1	10:10 00	115

Fig.9

(USER U1)

No2			
DATE	TIME	SEC.	BLOOD PRESSURE
2016/3/1	10:59	00	125
2016/3/1	10:59	30	122
2016/3/1	11:00	00	119
2016/3/1	11:00	30	117
2016/3/1	11:01	00	118
2016/3/1	11:01	30	129
2016/3/1	11:02	00	133
2016/3/1	11:02	30	135
2016/3/1	11:03	00	128
2016/3/1	11:03	30	122
2016/3/1	11:04	00	123

Fig.10

(USER U1)

No3			
DATE	TIME	SEC.	BLOOD PRESSURE
2016/3/1	11:04	00	123
2016/3/1	11:04	30	122
2016/3/1	11:05	00	119
2016/3/1	11:05	30	125
2016/3/1	11:06	00	120
2016/3/1	11:06	30	117
2016/3/1	11:07	00	117
2016/3/1	11:07	30	125
2016/3/1	11:08	00	131
2016/3/1	11:08	30	134
2016/3/1	11:09	00	132
2016/3/1	11:09	30	135
2016/3/1	11:10	00	130
2016/3/1	11:10	30	121
2016/3/1	11:11	00	115
2016/3/1	11:11	30	118
2016/3/1	11:12	00	117
2016/3/1	11:13	30	124
2016/3/1	11:13	00	128
2016/3/1	11:14	30	123
2016/3/1	11:14	00	119
2016/3/1	11:15	30	117
2016/3/1	11:15	00	119

Fig.11

(USER U1)

No4		
DATE	TIME SEC.	BLOOD PRESSURE
2016/3/1	11:29 00	129
2016/3/1	11:29 30	132
2016/3/1	11:30 00	130
2016/3/1	11:30 30	128
2016/3/1	11:31 00	122
2016/3/1	11:31 30	119
2016/3/1	11:32 00	117
2016/3/1	11:32 30	124
2016/3/1	11:33 00	125
2016/3/1	11:33 30	123
2016/3/1	11:34 00	122
2016/3/1	11:34 30	125
2016/3/1	11:35 00	119
2016/3/1	11:35 30	117
2016/3/1	11:36 00	117
2016/3/1	11:36 30	124
2016/3/1	11:37 00	128
2016/3/1	11:37 30	125
2016/3/1	11:38 00	119

Fig.12

(USER U1)

No5			
DATE	TIME	SEC.	BLOOD PRESSURE
2016/3/1	11:54	00	135
2016/3/1	11:54	30	133
2016/3/1	11:55	00	134
2016/3/1	11:55	30	132
2016/3/1	11:56	00	128
2016/3/1	11:56	30	125
2016/3/1	11:57	00	121
2016/3/1	11:57	30	116
2016/3/1	11:58	00	118
2016/3/1	11:58	30	116
2016/3/1	11:59	00	120
2016/3/1	11:59	30	121
2016/3/1	12:00	00	122
2016/3/1	12:00	30	123
2016/3/1	12:01	00	121
2016/3/1	12:01	30	115
2016/3/1	12:02	00	119

Fig.13

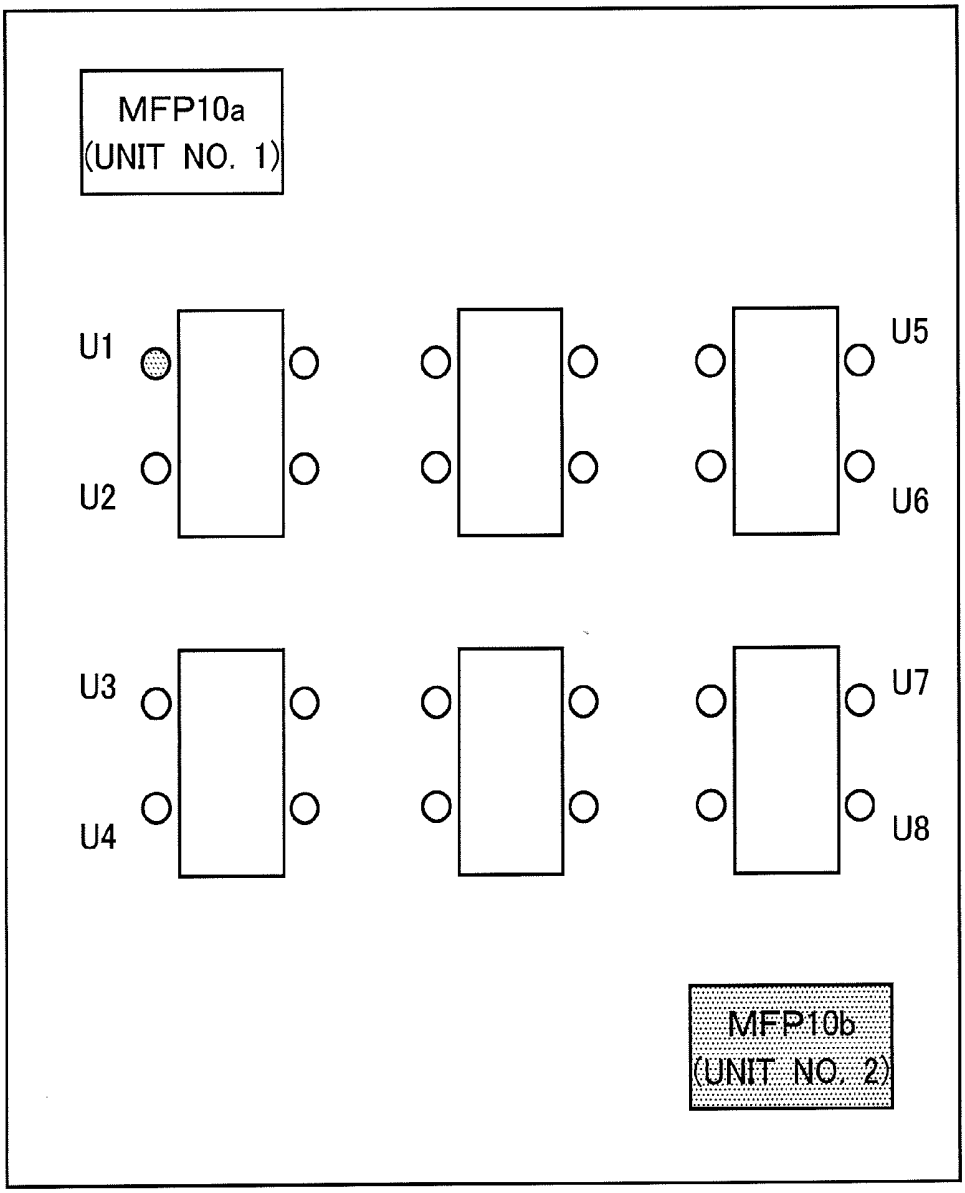

Fig.14

(MFP10a, USER U1)

	No1		
	DATE	TIME SEC.	BLOOD PRESSURE/ JOB HISTORY
T0	2016/3/1	9:59 00	116
	2016/3/1	9:59 30	118
	2016/3/1	10:00 00	116
T1	2016/3/1	10:00 17	LOGIN
	2016/3/1	10:00 30	119
	2016/3/1	10:01 00	116
T2	2016/3/1	10:01 05	JOB START
	2016/3/1	10:01 30	119
	2016/3/1	10:02 00	117
	2016/3/1	10:02 30	119
	2016/3/1	10:03 00	125
	2016/3/1	10:03 30	133
	2016/3/1	10:04 00	135
	2016/3/1	10:04 30	132
T3	2016/3/1	10:04 46	JOB END
	2016/3/1	10:05 00	131
	2016/3/1	10:05 30	126
	2016/3/1	10:06 00	121
	2016/3/1	10:06 30	122
	2016/3/1	10:07 00	123
	2016/3/1	10:07 30	119
	2016/3/1	10:08 00	125
	2016/3/1	10:08 30	121
	2016/3/1	10:09 00	115
	2016/3/1	10:09 30	118
T4	2016/3/1	10:09 46	LOGOUT

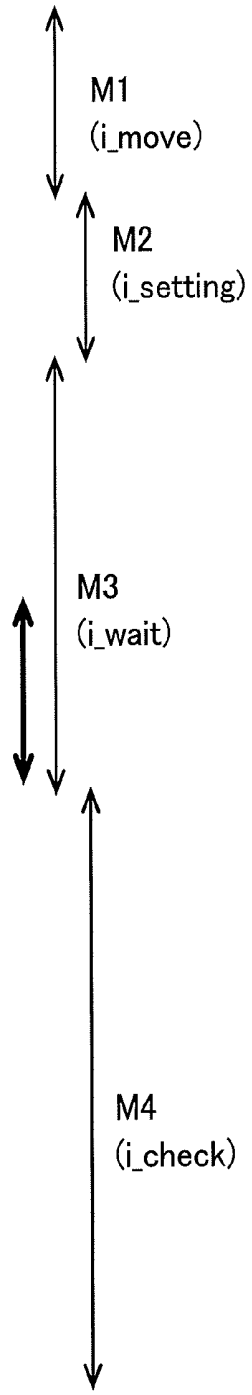

Fig.15

(MFP10a, USER U1)

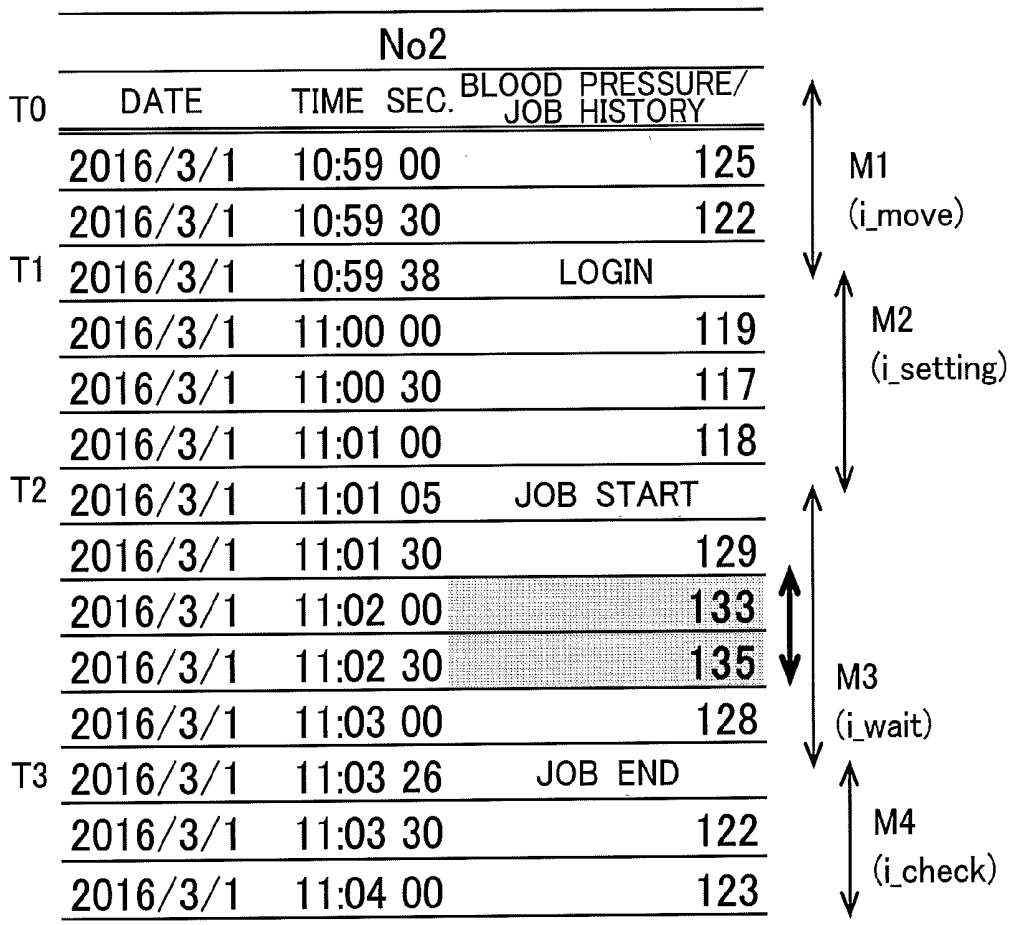

Fig.16

(MFP10a, USER U1)

	No3		
	DATE	TIME SEC.	BLOOD PRESSURE/ JOB HISTORY
	2016/3/1	11:04 00	123
	2016/3/1	11:04 30	122
	2016/3/1	11:05 00	119
T2	2016/3/1	11:05 22	JOB START
	2016/3/1	11:05 30	125
	2016/3/1	11:06 00	120
	2016/3/1	11:06 30	117
	2016/3/1	11:07 00	117
	2016/3/1	11:07 30	125
	2016/3/1	11:08 00	131
	2016/3/1	11:08 30	134
	2016/3/1	11:09 00	132
	2016/3/1	11:09 30	135
	2016/3/1	11:10 00	130
T3	2016/3/1	11:10 11	JOB END
	2016/3/1	11:10 30	121
	2016/3/1	11:11 00	115
	2016/3/1	11:11 30	118
	2016/3/1	11:12 00	117
	2016/3/1	11:13 30	124
	2016/3/1	11:13 00	128
	2016/3/1	11:14 30	123
	2016/3/1	11:14 00	119
	2016/3/1	11:15 30	117
	2016/3/1	11:15 00	119
T4	2016/3/1	11:15 11	LOGOUT

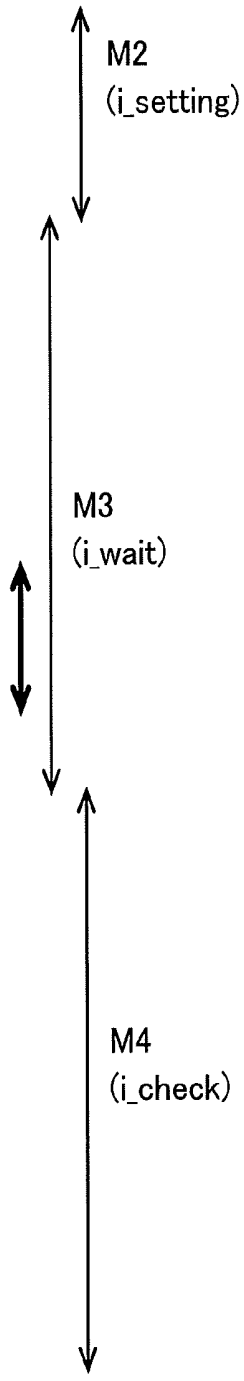

Fig.17

(MFP10b, USER U1)

	No4		
	DATE	TIME SEC.	BLOOD PRESSURE/ JOB HISTORY
T0	2016/3/1	11:29 00	129
	2016/3/1	11:29 30	132
T1	2016/3/1	11:29 45	LOGIN
	2016/3/1	11:30 00	130
	2016/3/1	11:30 30	128
	2016/3/1	11:31 00	122
T2	2016/3/1	11:31 22	JOB START
	2016/3/1	11:31 30	119
	2016/3/1	11:32 00	117
	2016/3/1	11:32 30	124
	2016/3/1	11:33 00	125
T3	2016/3/1	11:33 14	JOB END
	2016/3/1	11:33 30	123
	2016/3/1	11:34 00	122
	2016/3/1	11:34 30	125
	2016/3/1	11:35 00	119
	2016/3/1	11:35 30	117
	2016/3/1	11:36 00	117
	2016/3/1	11:36 30	124
	2016/3/1	11:37 00	128
	2016/3/1	11:37 30	125
	2016/3/1	11:38 00	119
T4	2016/3/1	11:38 06	LOGOUT

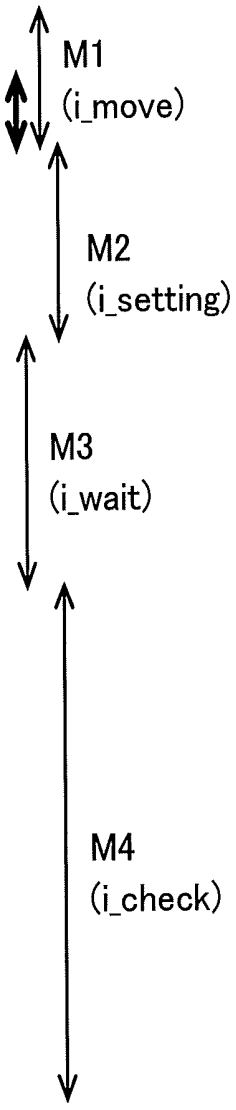

Fig.18

(MFP10b, USER U1)

	No5		
	DATE	TIME SEC.	BLOOD PRESSURE/ JOB HISTORY
T0	2016/3/1	11:54 00	135
	2016/3/1	11:54 30	133
	2016/3/1	11:55 00	134
T1	2016/3/1	11:55 04	LOGIN
	2016/3/1	11:55 30	132
	2016/3/1	11:56 00	128
T2	2016/3/1	11:56 18	JOB START
	2016/3/1	11:56 30	125
	2016/3/1	11:57 00	121
	2016/3/1	11:57 30	116
T3	2016/3/1	11:57 52	JOB END
	2016/3/1	11:58 00	118
	2016/3/1	11:58 30	116
	2016/3/1	11:59 00	120
	2016/3/1	11:59 30	121
	2016/3/1	12:00 00	122
	2016/3/1	12:00 30	123
	2016/3/1	12:01 00	121
	2016/3/1	12:01 30	115
	2016/3/1	12:02 00	119
T4	2016/3/1	12:02 11	LOGOUT

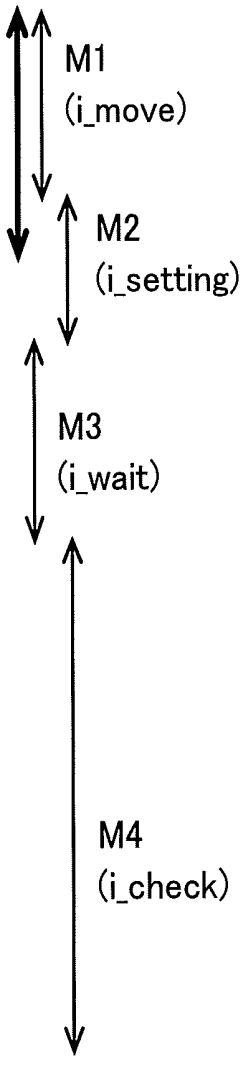

Fig.19

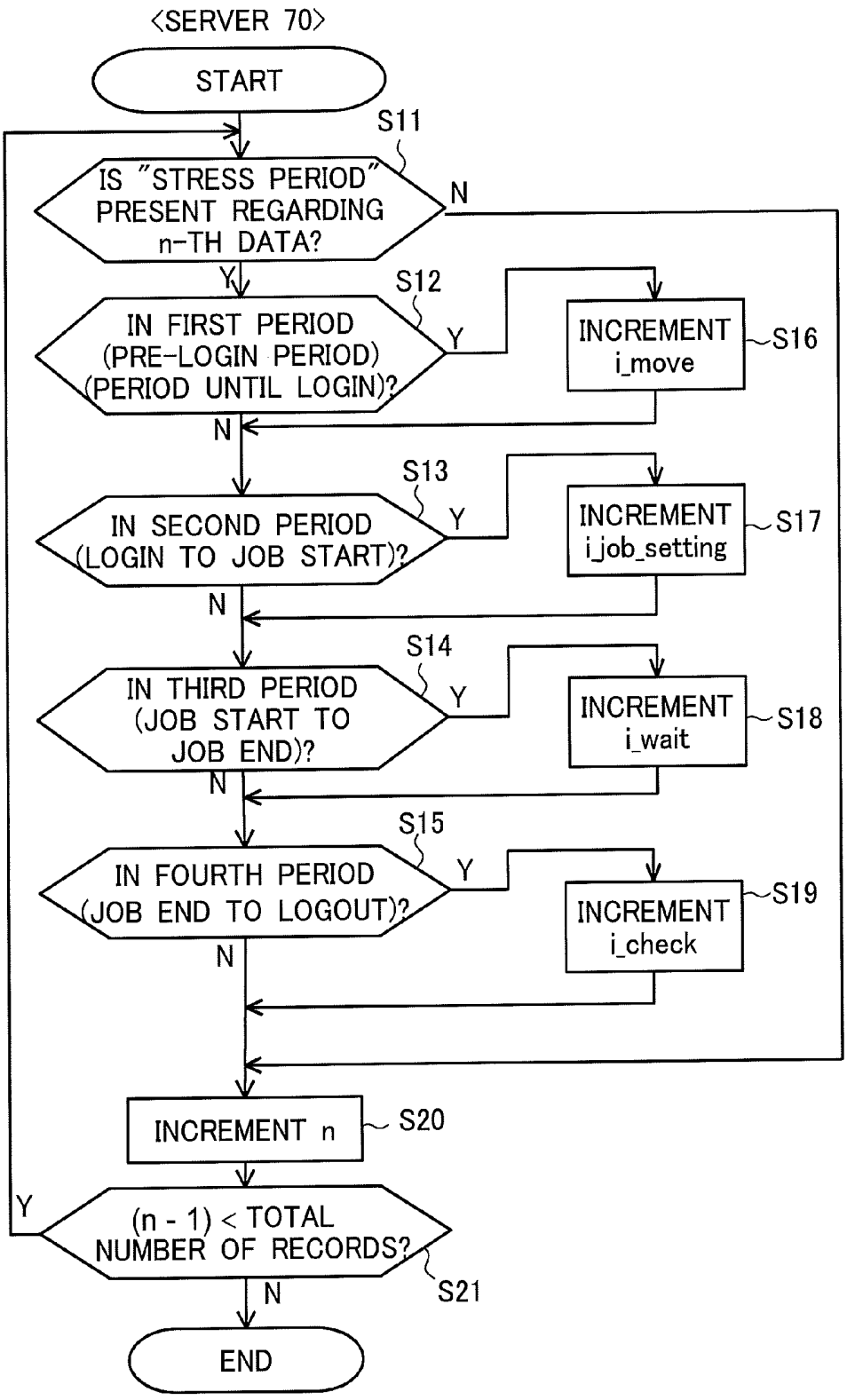
<SERVER 70>
START
S11
IS "STRESS PERIOD" PRESENT REGARDING n-TH DATA?
N
Y
S12
IN FIRST PERIOD (PRE-LOGIN PERIOD) (PERIOD UNTIL LOGIN)?
Y
INCREMENT i_move
S16
N
S13
IN SECOND PERIOD (LOGIN TO JOB START)?
Y
INCREMENT i_job_setting
S17
N
S14
IN THIRD PERIOD (JOB START TO JOB END)?
Y
INCREMENT i_wait
S18
N
S15
IN FOURTH PERIOD (JOB END TO LOGOUT)?
Y
INCREMENT i_check
S19
N
INCREMENT n
S20
Y
(n - 1) < TOTAL NUMBER OF RECORDS?
S21
N
END

Fig.20

	NUMBER OF TIMES OF STRESS FEELING			
	i_move	i_setting	i_wait	i_check
	M1	M2	M3	M4
MFP_A	0	0	4	2
MFP_B	3	1	0	0

Fig.21

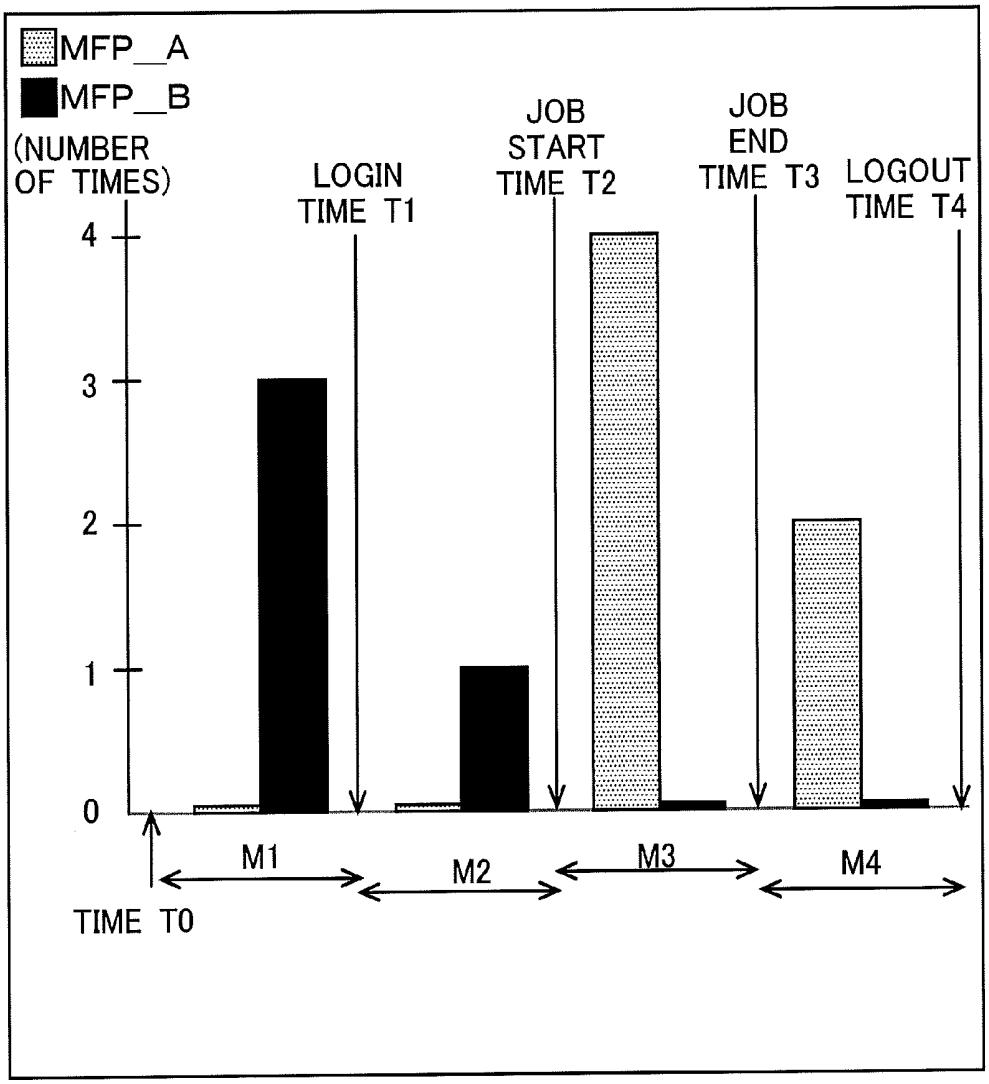
MFP_A
MFP_B
(NUMBER OF TIMES)
4
3
2
1
0
LOGIN TIME T1
JOB START TIME T2
JOB END TIME T3
LOGOUT TIME T4
M1
M2
M3
M4
TIME T0

Fig.22

<IMPROVEMENT PROPOSAL 3>

USER U1 FEELS STRESS FROM WAITING TIME UNTIL PROCESSING COMPLETION OF MFP 10a (UNIT NO. 1).

IMPROVEMENT OF PRINTING SPEED OF MFP 10a TO SPEED EQUAL TO OR HIGHER THAN SPEED OF MFP 10b (UNIT NO. 2) IS PROPOSED.
(REPLACEMENT BY HIGHER SPEED APPARATUS IS PROPOSED.)

Fig.23

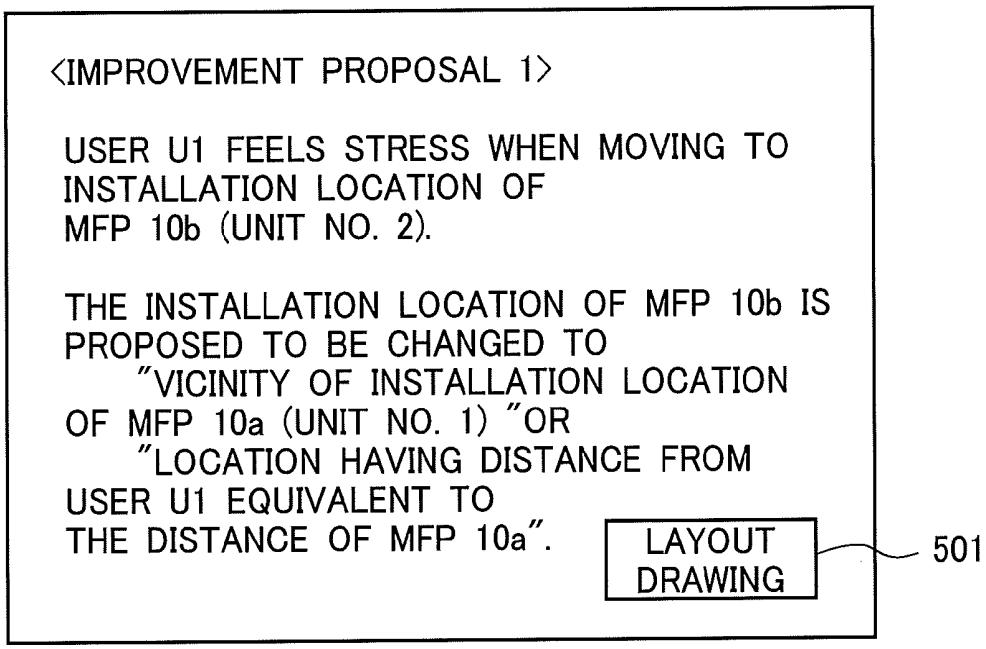
<IMPROVEMENT PROPOSAL 1>
USER U1 FEELS STRESS WHEN MOVING TO INSTALLATION LOCATION OF MFP 10b (UNIT NO. 2).
THE INSTALLATION LOCATION OF MFP 10b IS PROPOSED TO BE CHANGED TO
"VICINITY OF INSTALLATION LOCATION OF MFP 10a (UNIT NO. 1) "OR
"LOCATION HAVING DISTANCE FROM USER U1 EQUIVALENT TO THE DISTANCE OF MFP 10a".
LAYOUT DRAWING
501

Fig.24

<COPY JOB/SCAN JOB>

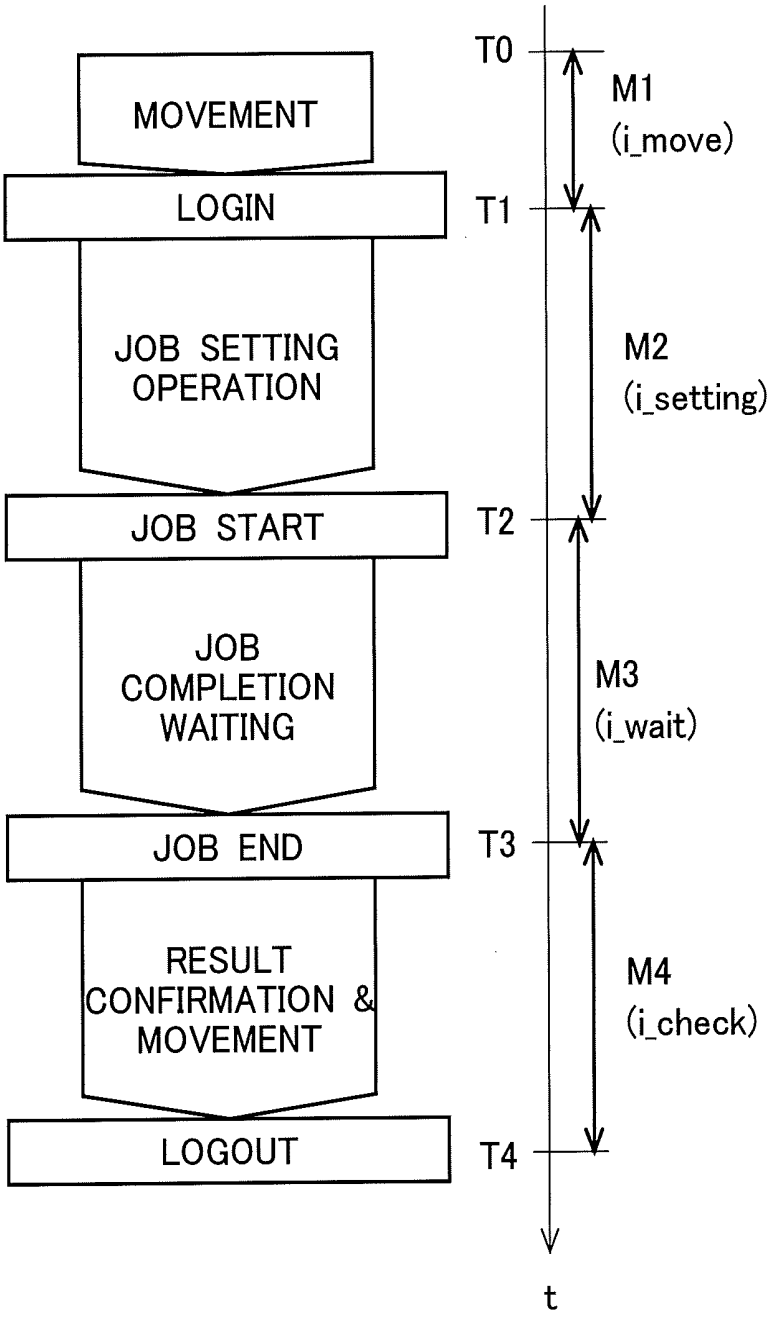

Fig.25

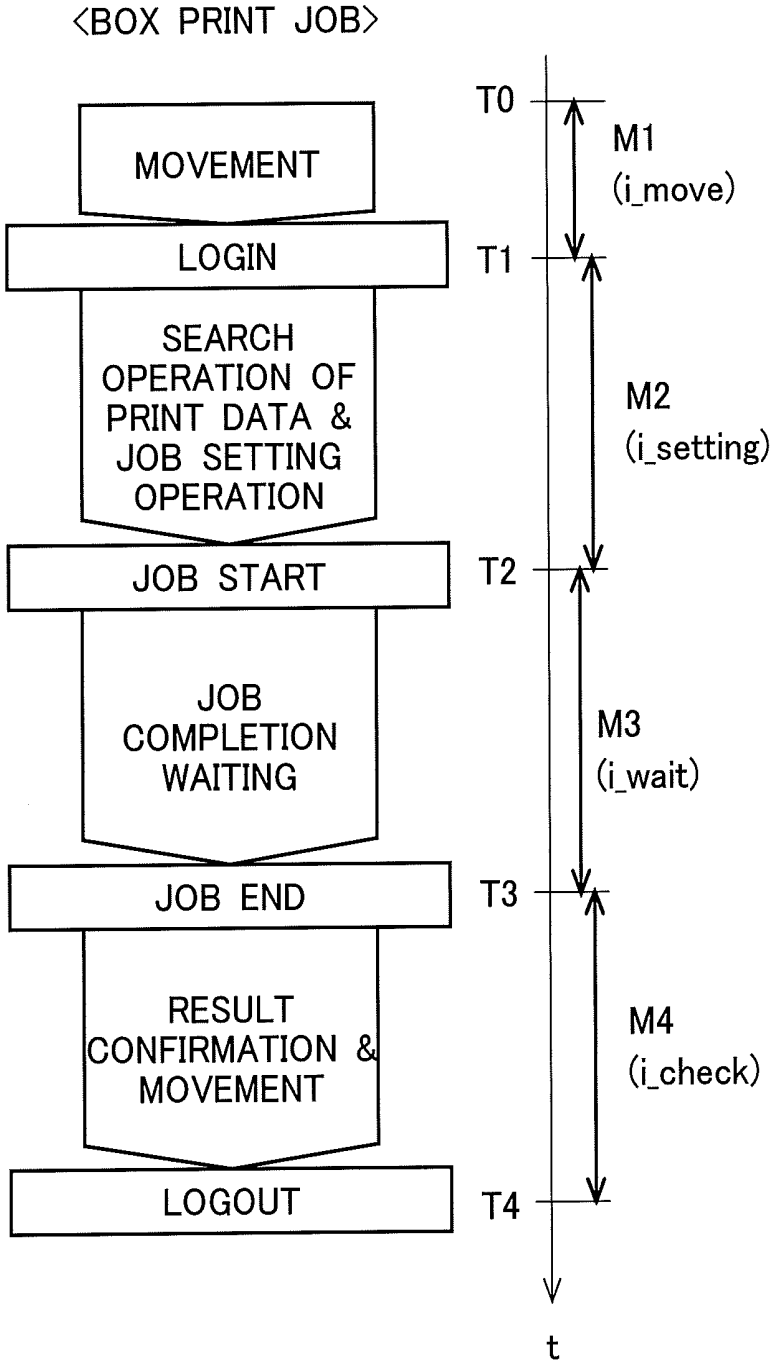
<BOX PRINT JOB>
MOVEMENT
LOGIN
SEARCH OPERATION OF PRINT DATA & JOB SETTING OPERATION
JOB START
JOB COMPLETION WAITING
JOB END
RESULT CONFIRMATION & MOVEMENT
LOGOUT
T0
T1
T2
T3
T4
M1
(i_move)
M2
(i_setting)
M3
(i_wait)
M4
(i_check)
t

Fig.26

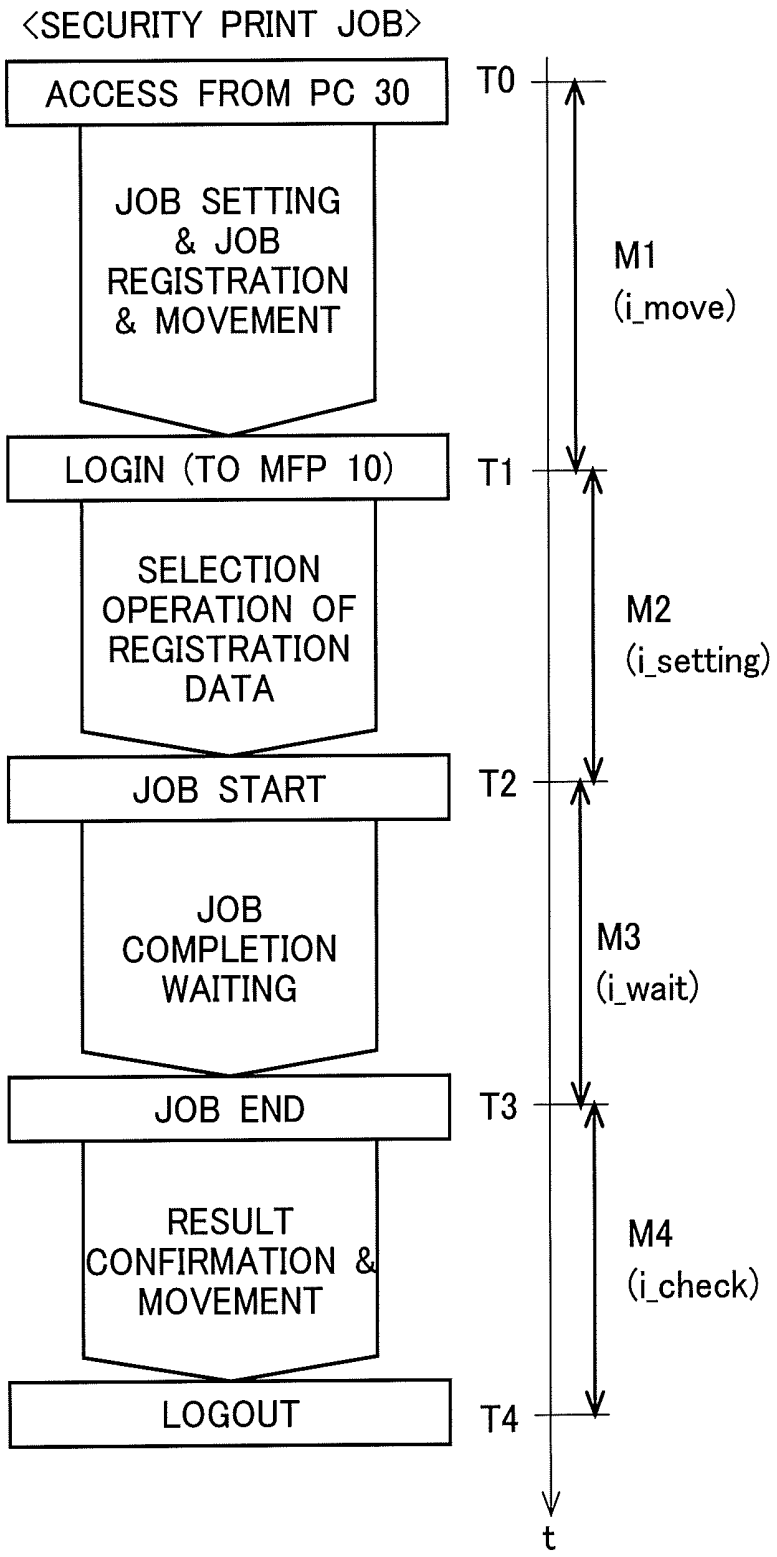
<SECURITY PRINT JOB>
ACCESS FROM PC 30
JOB SETTING & JOB REGISTRATION & MOVEMENT
LOGIN (TO MFP 10)
SELECTION OPERATION OF REGISTRATION DATA
JOB START
JOB COMPLETION WAITING
JOB END
RESULT CONFIRMATION & MOVEMENT
LOGOUT
T0
T1
T2
T3
T4
M1
(i_move)
M2
(i_setting)
M3
(i_wait)
M4
(i_check)
t

Fig.27

No	USER NAME	MFP NAME	TYPE OF JOB	LOGIN TIME	JOB START TIME	JOB END TIME	LOGOUT TIME
1	USER U7	MFP_A	COPY	2016/3/1 10:00	2016/3/1 10:01	2016/3/1 10:04	2016/3/1 10:09
2	USER U7	MFP_A	COPY	2016/3/1 10:59	2016/3/1 11:01	2016/3/1 11:03	2016/3/1 11:15
3	USER U7	MFP_A	COPY	2016/3/1 10:59	2016/3/1 11:04	2016/3/1 11:10	2016/3/1 11:15
4	USER U8	MFP_A	COPY	2016/3/1 11:29	2016/3/1 11:30	2016/3/1 11:33	2016/3/1 11:42
5	USER U8	MFP_A	COPY	2016/3/1 11:29	2016/3/1 11:35	2016/3/1 11:37	2016/3/1 11:42
6	USER U7	MFP_A	COPY	2016/3/1 13:35	2016/3/1 13:38	2016/3/1 13:40	2016/3/1 13:48
7	USER U7	MFP_A	COPY	2016/3/1 13:35	2016/3/1 13:41	2016/3/1 13:43	2016/3/1 13:48
8	USER U8	MFP_A	COPY	2016/3/1 15:07	2016/3/1 15:08	2016/3/1 15:12	2016/3/1 15:24
9	USER U8	MFP_A	COPY	2016/3/1 15:07	2016/3/1 15:15	2016/3/1 15:19	2016/3/1 15:24
10	USER U7	MFP_A	COPY	2016/3/1 15:45	2016/3/1 15:46	2016/3/1 15:47	2016/3/1 15:52

Fig.28

No	USER NAME	MFP NAME	TYPE OF JOB	MFP USE START TIME	MFP USE END TIME
1	USER U7	MFP_A	COPY	2016/3/1 10:00	2016/3/1 10:09
2	USER U7	MFP_A	COPY	2016/3/1 10:59	2016/3/1 11:15
3	USER U7	MFP_A	COPY	2016/3/1 10:59	2016/3/1 11:15
4	USER U8	MFP_A	COPY	2016/3/1 11:29	2016/3/1 11:42
5	USER U8	MFP_A	COPY	2016/3/1 11:29	2016/3/1 11:42
6	USER U7	MFP_A	COPY	2016/3/1 13:35	2016/3/1 13:48
7	USER U7	MFP_A	COPY	2016/3/1 13:35	2016/3/1 13:48
8	USER U8	MFP_A	COPY	2016/3/1 15:07	2016/3/1 15:24
9	USER U8	MFP_A	COPY	2016/3/1 15:07	2016/3/1 15:24
10	USER U7	MFP_A	COPY	2016/3/1 15:45	2016/3/1 15:52

Fig.29

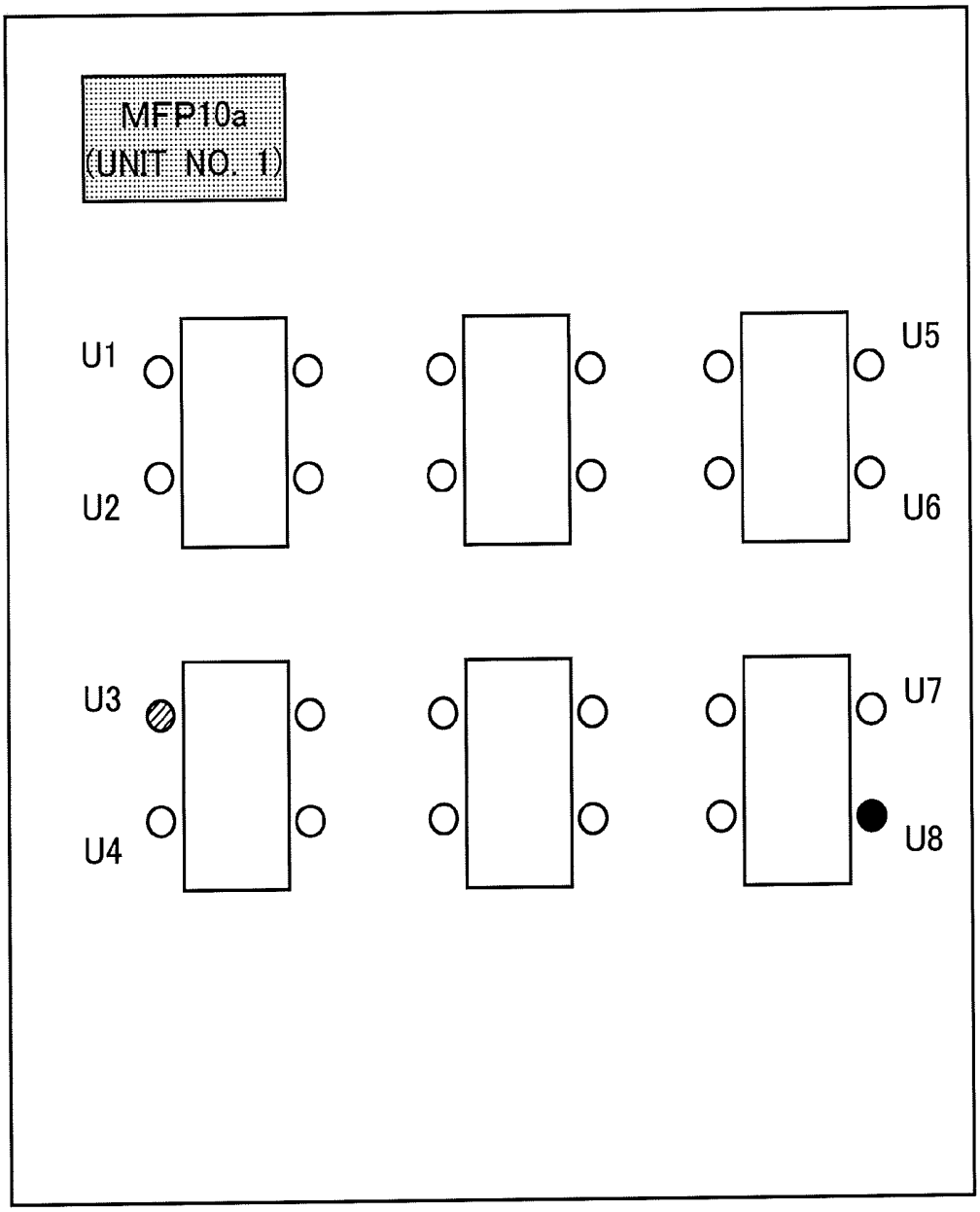

Fig.30

(USER U7)

No1		
DATE	TIME SEC.	BLOOD PRESSURE
2016/3/1	9:59 00	116
2016/3/1	9:59 30	118
2016/3/1	10:00 00	116
2016/3/1	10:00 30	119
2016/3/1	10:01 00	116
2016/3/1	10:01 30	119
2016/3/1	10:02 00	117
2016/3/1	10:02 30	119
2016/3/1	10:03 00	125
2016/3/1	10:03 30	131
2016/3/1	10:04 00	133
2016/3/1	10:04 30	135
2016/3/1	10:05 00	132
2016/3/1	10:05 30	126
2016/3/1	10:06 00	121
2016/3/1	10:06 30	122
2016/3/1	10:07 00	123
2016/3/1	10:07 30	119
2016/3/1	10:08 00	125
2016/3/1	10:08 30	121
2016/3/1	10:09 00	115
2016/3/1	10:09 30	118
2016/3/1	10:10 00	115

Fig.31

(USER U7)

No2		
DATE	TIME SEC.	BLOOD PRESSURE
2016/3/1	10:59 00	125
2016/3/1	10:59 30	122
2016/3/1	11:00 00	119
2016/3/1	11:00 30	117
2016/3/1	11:01 00	118
2016/3/1	11:01 30	129
2016/3/1	11:02 00	122
2016/3/1	11:02 30	125
2016/3/1	11:03 00	128
2016/3/1	11:03 30	127
2016/3/1	11:04 00	125

Fig.32

(USER U7)

No3		
DATE	TIME SEC.	BLOOD PRESSURE
2016/3/1	11:04 00	125
2016/3/1	11:04 30	122
2016/3/1	11:05 00	125
2016/3/1	11:05 30	126
2016/3/1	11:06 00	128
2016/3/1	11:06 30	130
2016/3/1	11:07 00	133
2016/3/1	11:07 30	135
2016/3/1	11:08 00	134
2016/3/1	11:08 30	136
2016/3/1	11:09 00	132
2016/3/1	11:09 30	130
2016/3/1	11:10 00	129
2016/3/1	11:10 30	121
2016/3/1	11:11 00	115
2016/3/1	11:11 30	118
2016/3/1	11:12 00	117
2016/3/1	11:13 30	124
2016/3/1	11:13 00	128
2016/3/1	11:14 30	123
2016/3/1	11:14 00	119
2016/3/1	11:15 30	117
2016/3/1	11:15 00	119

Fig.33

(USER U8)

No4		
DATE	TIME SEC.	BLOOD PRESSURE
2016/3/1	11:29 00	136
2016/3/1	11:29 30	138
2016/3/1	11:30 00	135
2016/3/1	11:30 30	132
2016/3/1	11:31 00	125
2016/3/1	11:31 30	117
2016/3/1	11:32 00	124
2016/3/1	11:32 30	128
2016/3/1	11:33 00	123
2016/3/1	11:33 30	131
2016/3/1	11:34 00	130
2016/3/1	11:34 30	129

Fig.34

(USER U8)

No5		
DATE	TIME SEC.	BLOOD PRESSURE
2016/3/1	11:34 00	130
2016/3/1	11:34 30	129
2016/3/1	11:35 00	125
2016/3/1	11:35 30	126
2016/3/1	11:36 00	130
2016/3/1	11:36 30	129
2016/3/1	11:37 00	120
2016/3/1	11:37 30	117
2016/3/1	11:38 00	124
2016/3/1	11:38 30	128
2016/3/1	11:39 00	123
2016/3/1	11:39 30	125
2016/3/1	11:40 00	120
2016/3/1	11:40 30	122
2016/3/1	11:41 00	125
2016/3/1	11:41 30	120
2016/3/1	11:42 00	124
2016/3/1	11:42 30	128
2016/3/1	11:43 00	124

Fig.35

(MFP10a, USER U7)

	No1			
	DATE	TIME SEC.	BLOOD PRESSURE/ JOB HISTORY	
T0	2016/3/1	9:59 00	116	
	2016/3/1	9:59 30	118	
	2016/3/1	10:00 00	116	
T1	2016/3/1	10:00 17	LOGIN	
	2016/3/1	10:00 30	119	
	2016/3/1	10:01 00	116	
T2	2016/3/1	10:01 05	JOB START	
	2016/3/1	10:01 30	119	
	2016/3/1	10:02 00	117	
	2016/3/1	10:02 30	119	
	2016/3/1	10:03 00	125	
	2016/3/1	10:03 30	131	
	2016/3/1	10:04 00	133	
	2016/3/1	10:04 30	135	
T3	2016/3/1	10:04 46	JOB END	
	2016/3/1	10:05 00	132	
	2016/3/1	10:05 30	126	
	2016/3/1	10:06 00	121	
	2016/3/1	10:06 30	122	
	2016/3/1	10:07 00	123	
	2016/3/1	10:07 30	119	
	2016/3/1	10:08 00	125	
	2016/3/1	10:08 30	121	
	2016/3/1	10:09 00	115	
	2016/3/1	10:09 30	118	
T4	2016/3/1	10:09 46	LOGOUT	
	2016/3/1	10:10 00	115	

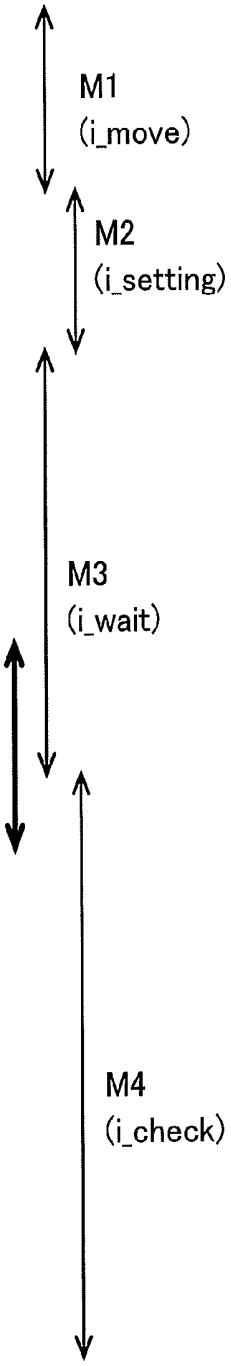

Fig.36

(MFP10a, USER U7)

	No2			
	DATE	TIME SEC.	BLOOD PRESSURE/ JOB HISTORY	
T0	2016/3/1	10:59 00	125	M1 (i_move)
	2016/3/1	10:59 30	122	
T1	2016/3/1	10:59 38	LOGIN	M2 (i_setting)
	2016/3/1	11:00 00	119	
	2016/3/1	11:00 30	117	
T2	2016/3/1	11:01 05	JOB START	M3 (i_wait)
	2016/3/1	11:01 00	118	
	2016/3/1	11:01 30	129	
	2016/3/1	11:02 00	122	
	2016/3/1	11:02 30	125	
T3	2016/3/1	11:03 26	JOB END	M4 (i_check)
	2016/3/1	11:03 00	128	
	2016/3/1	11:03 30	127	
	2016/3/1	11:04 00	125	

Fig.37

(MFP10a, USER U7)

	No3			
	DATE	TIME SEC.	BLOOD PRESSURE/ JOB HISTORY	
	2016/3/1	11:04 00	125	
	2016/3/1	11:04 30	122	
T2	2016/3/1	11:04 52	JOB START	
	2016/3/1	11:05 00	125	
	2016/3/1	11:05 30	126	
	2016/3/1	11:06 00	128	
	2016/3/1	11:06 30	130	
	2016/3/1	11:07 00	133	
	2016/3/1	11:07 30	135	
	2016/3/1	11:08 00	134	
	2016/3/1	11:08 30	136	
	2016/3/1	11:09 00	132	
	2016/3/1	11:09 30	130	
	2016/3/1	11:10 00	129	
T3	2016/3/1	11:10 11	JOB END	
	2016/3/1	11:10 30	121	
	2016/3/1	11:11 00	115	
	2016/3/1	11:11 30	118	
	2016/3/1	11:12 00	117	
	2016/3/1	11:13 30	124	
	2016/3/1	11:13 00	128	
	2016/3/1	11:14 30	123	
	2016/3/1	11:14 00	119	
	2016/3/1	11:15 30	117	
	2016/3/1	11:15 00	119	
T4	2016/3/1	11:15 11	LOGOUT	

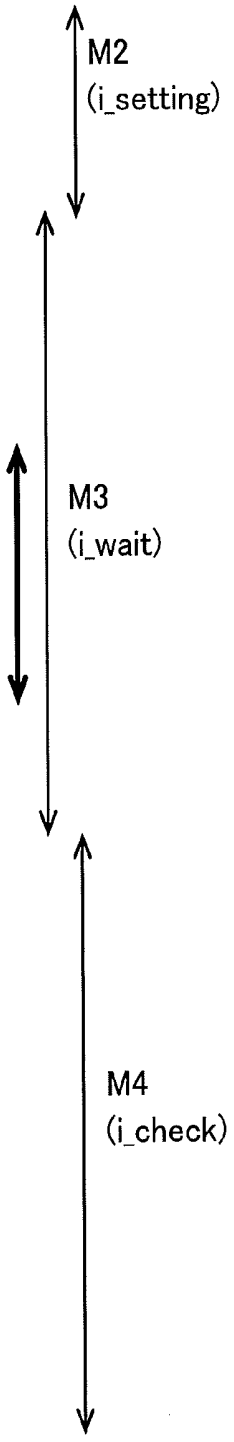

Fig.38

(MFP10a, USER U8)

	No4			
	DATE	TIME SEC.	BLOOD PRESSURE/ JOB HISTORY	
T0	2016/3/1	11:29 00	136	M1 (i_move)
	2016/3/1	11:29 30	138	
T1	2016/3/1	11:29 35	LOGIN	
	2016/3/1	11:30 00	135	M2 (i_setting)
	2016/3/1	11:30 30	132	
T2	2016/3/1	11:30 43	JOB START	
	2016/3/1	11:31 00	125	M3 (i_wait)
	2016/3/1	11:31 30	117	
	2016/3/1	11:32 00	124	
	2016/3/1	11:32 30	128	
	2016/3/1	11:33 00	123	
	2016/3/1	11:33 30	131	
T3	2016/3/1	11:33 32	JOB END	M4 (i_check)
	2016/3/1	11:34 00	130	
	2016/3/1	11:34 30	129	

Fig.39

(MFP10a, USER U8)

	No5		
	DATE	TIME SEC.	BLOOD PRESSURE/ JOB HISTORY
	2016/3/1	11:34 00	130
	2016/3/1	11:34 30	129
	2016/3/1	11:35 00	125
	2016/3/1	11:35 30	126
T2	2016/3/1	11:35 51	JOB START
	2016/3/1	11:36 00	130
	2016/3/1	11:36 30	129
	2016/3/1	11:37 00	120
	2016/3/1	11:37 30	117
T3	2016/3/1	11:37 40	JOB END
	2016/3/1	11:38 00	124
	2016/3/1	11:38 30	128
	2016/3/1	11:39 00	123
	2016/3/1	11:39 30	125
	2016/3/1	11:40 00	120
	2016/3/1	11:40 30	122
	2016/3/1	11:41 00	125
	2016/3/1	11:41 30	120
	2016/3/1	11:42 00	124
T4	2016/3/1	11:42 30	128
	2016/3/1	11:42 40	LOGOUT

M2 (i_setting)

M3 (i_wait)

M4 (i_check)

Fig.40

	NUMBER OF TIMES OF STRESS FEELING			
	i_move	i_setting	i_wait	i_check
	M1	M2	M3	M4
USER U7	0	0	4	1
USER U8	2	1	0	0

Fig.41

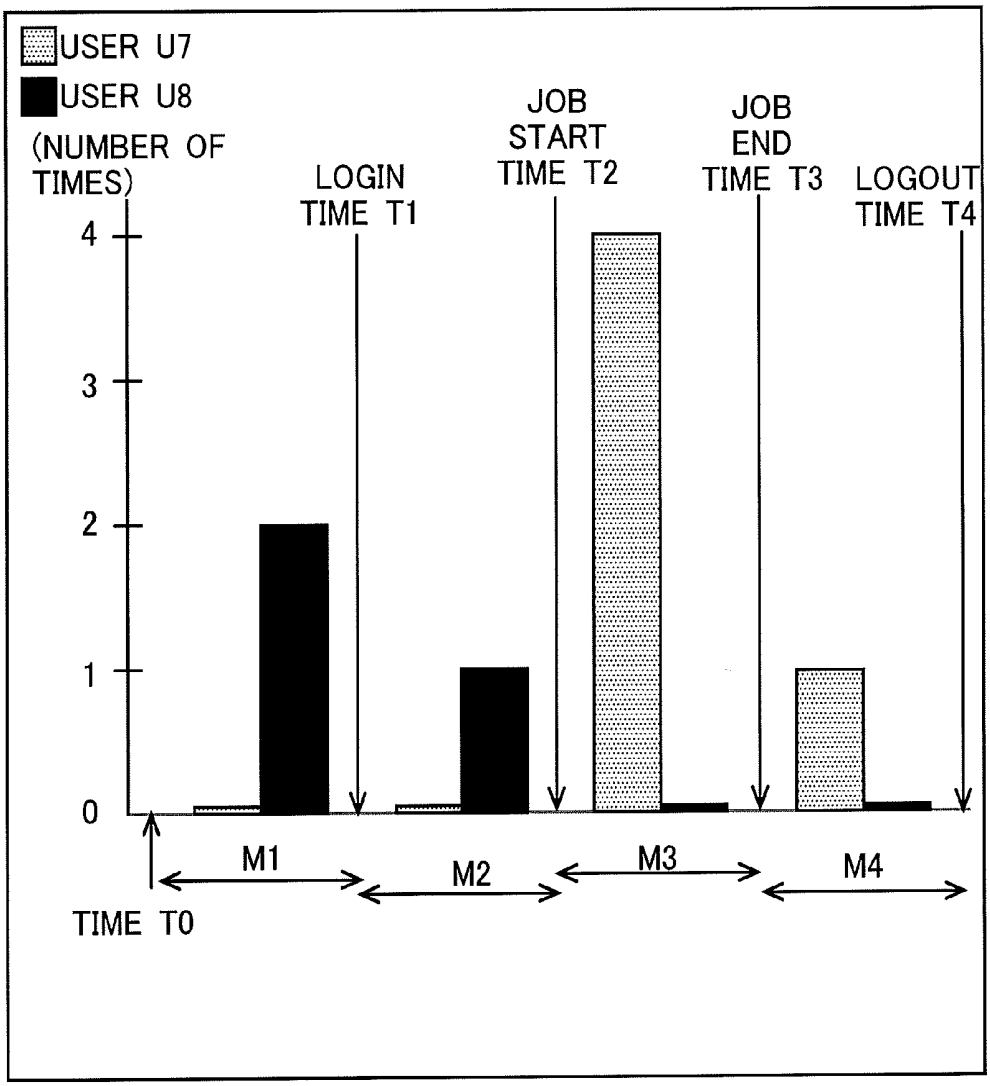
USER U7
USER U8
(NUMBER OF TIMES)
4
3
2
1
0
LOGIN TIME T1
JOB START TIME T2
JOB END TIME T3
LOGOUT TIME T4
M1
M2
M3
M4
TIME T0

Fig.42

	NUMBER OF TIMES OF STRESS FEELING			
	i_move	i_setting	i_wait	i_check
	M1	M2	M3	M4
USER U1	0	0	5	1
USER U2	0	2	0	1
USER U3	1	1	0	2
USER U4	0	0	0	0
USER U5	0	0	0	0
USER U6	0	0	0	0
USER U7	3	2	0	0
USER U8	0	0	0	0

Fig.43

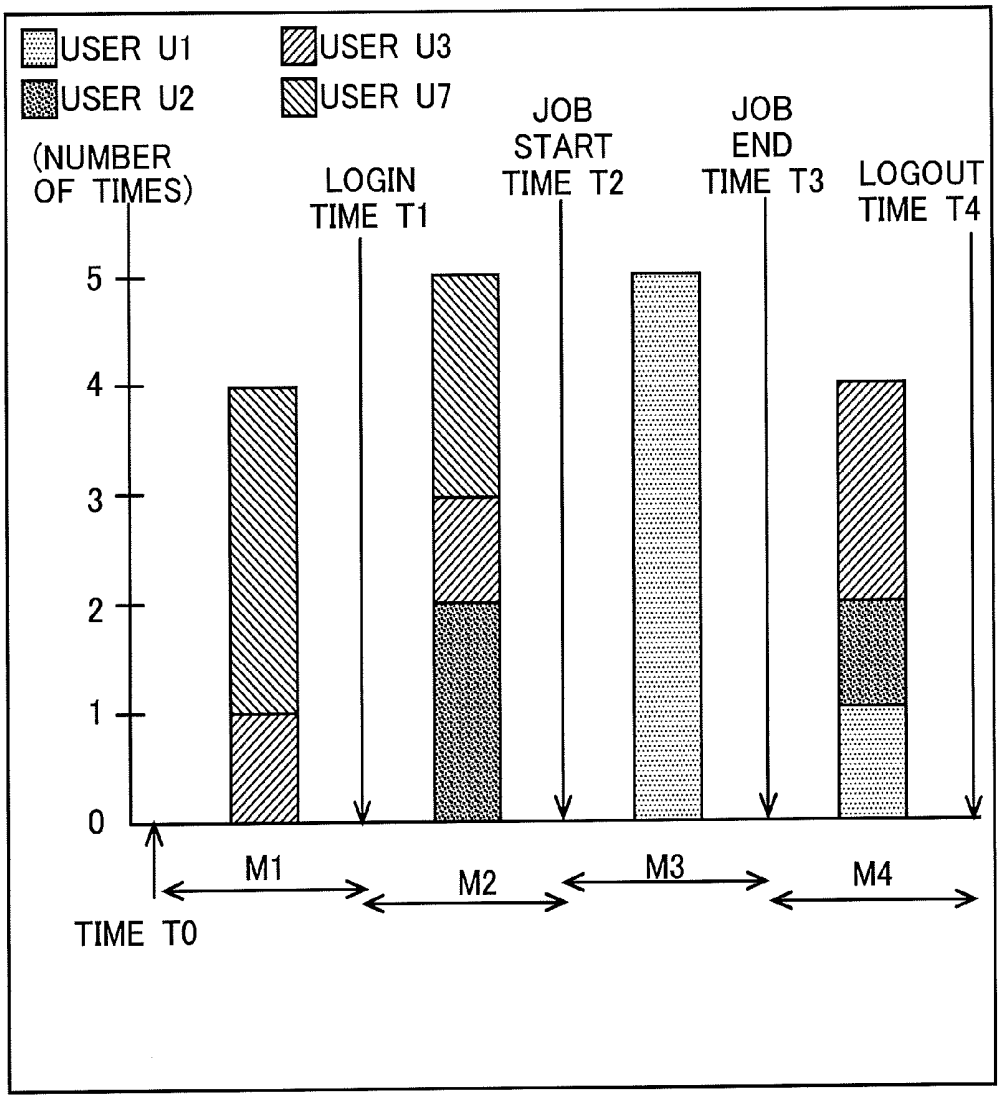
USER U1
USER U2
USER U3
USER U7
(NUMBER OF TIMES)
LOGIN TIME T1
JOB START TIME T2
JOB END TIME T3
LOGOUT TIME T4
5
4
3
2
1
0
M1
M2
M3
M4
TIME T0

IMAGE PROCESSING SYSTEM, ANALYZING APPARATUS, AND RECORDING MEDIUM

[0001] The present U.S. patent application claims a priority under the Paris Convention of Japanese patent application No. 2016-123491 filed on Jun. 22, 2016, the entirety of which is incorporated herein by references.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to an image processing system including an image processing apparatus such as a multi-functional peripheral (MFP), and technologies concerning the image processing system.

Description of the Background Art

[0003] In an office or the like, approach to optimize the usage environment of MFP (in other words, an approach to optimize an image processing system including an image processing apparatus) may be performed in some cases. Such an approach optimizes the environment of printout and document management by the MFP, and others, is also called "Optimized Print Services" or the like.

[0004] In such an approach, first an analysis on the current state regarding use of MFPs is generally performed. Specifically, quantitative data such as monthly numbers of scanned sheets and printed sheets are acquired, and qualitative data based on a hearing survey to the users or the like are acquired. On the basis of these pieces of data, problems in the office are extracted. As examples of such problems, problems based on the viewpoints of the operation state, layout, or the like of the MFP are shown.

[0005] The approach is carried out mainly for the purpose of cost reduction and productivity improvement.

[0006] Specifically, optimization aimed at "cost reduction" is performed, such as eliminating unnecessary MFPs to reduce the number of MFPs, arranging MFPs with appropriate processing capacity (not to place expensive MFPs with excessive processing capacity), and reducing consumed power in the entire office. Furthermore, optimization aimed at "productivity improvement" are also performed such that no state of the user waiting for usage of MFPs has occurred, the user's movement distance for using an MFP is reasonable, and the like.

[0007] In addition, although being different from the above-described technique, a technique of simplifying a login operation by using biological information (specifically, a fingerprint, an iris, a vein, and the like) for identifying an individual exists in an image processing apparatus such as an MFP (see Japanese Patent Application Laid-Open No. 2008-33391).

[0008] However, a trade-off relationship exists between cost reduction and productivity improvement in many cases. Productivity may decrease when excessive cost reduction is performed by placing great importance on the cost reduction. In many cases, the decrease in productivity is discovered by conducting hearing surveys to the users to acquire opinions in the work site. In order to avoid or suppress the decrease in productivity, it is preferable to perform further optimization by conducting analysis of the current state again.

[0009] Alternatively, as time passes (e.g., due to an increase in the number of office workers), there may be situations where the number of installed MFPs, processing capacity, and the like has become insufficient (that is, the situation where the productivity has lowered). Even in such a case, it is preferable to perform further optimization by conducting analysis of the current state again.

[0010] However, when the current state is analyzed, considerable cost and time are required to conduct a hearing survey to the users. Therefore, conducting the hearing survey (especially frequently) is not easy.

[0011] The technique described in Japanese Patent Application Laid-Open No. 2008-33391 is a technique of identifying an individual by using biological information (specifically, a fingerprint, an iris, a vein, and the like) and simplifying the login operation in the MFP, and thus it is not a technique of analyzing the current state.

SUMMARY OF THE INVENTION

[0012] An object of the present invention is to provide a technique capable of analyzing the current state of an image processing system relatively easily without necessarily requiring a hearing survey to the users.

[0013] A first aspect of the present invention provides an image processing system including an acquiring section that acquires biological information on a user who makes an image processing apparatus execute a job and operation information on the image processing apparatus, the biological information changing depending on a state of the user, an analysis section that analyzes stress of the user concerning use of the image processing apparatus, based on the biological information and the operation information, and an output section that outputs an analysis result obtained by the analysis section.

[0014] A second aspect of the present invention provides an analyzing apparatus including an acquiring section that acquires biological information on a user who makes an image processing apparatus execute a job and operation information on the image processing apparatus, the biological information changing depending on a state of the user, an analysis section that analyzes stress of the user concerning use of the image processing apparatus, based on the biological information and the operation information, and an output section that outputs an analysis result obtained by the analysis section.

[0015] A third aspect of the present invention provides a non-transitory computer-readable recording medium for recording a program that causes a computer to execute a process including the steps of a) acquiring biological information on a user who makes an image processing apparatus execute a job and operation information on the image processing apparatus, the biological information changing depending on a state of the user, b) analyzing stress of the user concerning use of the image processing apparatus, based on the biological information and the operation information, and c) outputting an analysis result of the step b).

[0016] These and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. **1** shows an image processing system;
[0018] FIG. **2** shows functional blocks of an MFP (image processing apparatus);
[0019] FIG. **3** is a functional block diagram showing a schematic configuration of a wearable terminal;
[0020] FIG. **4** is a functional block diagram showing a schematic configuration of a management server;
[0021] FIG. **5** is a conceptual diagram showing an operation in the present system;
[0022] FIG. **6** shows operation information on the MFP;
[0023] FIG. **7** is a diagram for illustrating a use period of the MFP for each job;
[0024] FIGS. **8** to **12** show biological information in extraction target periods for jobs "No. **1**" to "No. **5**", respectively;
[0025] FIG. **13** shows a layout in a room;
[0026] FIG. **14** shows a combination of the biological information of FIG. **8** and operation time of the MFP;
[0027] FIG. **15** shows a combination of the biological information of FIG. **9** and each operation time of the MFP;
[0028] FIG. **16** shows a combination of the biological information of FIG. **10** and each operation time of the MFP;
[0029] FIG. **17** shows a combination of the biological information of FIG. **11** and each operation time of the MFP;
[0030] FIG. **18** shows a combination of the biological information of FIG. **12** and each operation time of the MFP;
[0031] FIG. **19** is a flowchart showing a part of analysis processing in the management server;
[0032] FIG. **20** shows an analysis result (tabular form);
[0033] FIG. **21** shows an analysis result (graphic form);
[0034] FIG. **22** shows a display screen of an improvement proposal;
[0035] FIG. **23** shows a display screen of another improvement proposal;
[0036] FIG. **24** shows an operation of the MFP in chronological order in copy job;
[0037] FIG. **25** shows an operation of the MFP in chronological order in box print job;
[0038] FIG. **26** shows an operation of the MFP in chronological order in security print job;
[0039] FIG. **27** shows operation information on an MFP (Second Embodiment);
[0040] FIG. **28** is a diagram for illustrating a use period of the MFP in each job;
[0041] FIG. **29** shows a layout in a room;
[0042] FIGS. **30** to **34** show biological information of extraction target periods for the jobs "No. **1**" to "No. **5**", respectively;
[0043] FIG. **35** shows a combination of biological information of FIG. **30** and each operation time of the MFP;
[0044] FIG. **36** shows a combination of biological information of FIG. **31** and each operation time of the MFP;
[0045] FIG. **37** shows a combination of biological information of FIG. **32** and each operation time of the MFP;
[0046] FIG. **38** shows a combination of biological information of FIG. **33** and each operation time of the MFP;
[0047] FIG. **39** shows a combination of biological information of FIG. **34** and each operation time of the MFP;
[0048] FIG. **40** shows an analysis result (tabular form);
[0049] FIG. **41** shows an analysis result (graph form);
[0050] FIG. **42** shows another analysis result (tabular form); and
[0051] FIG. **43** shows another analysis result (graph form).

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0052] Hereinafter, an embodiment of the present invention will be described with reference to the drawings. However, the scope of the invention is not limited to the illustrated examples.

1. First Embodiment

1-1. Configuration Outline

[0053] FIG. **1** shows an image processing system **1** according to the present invention. As shown in FIG. **1**, the image processing system **1** includes an MFP (image processing apparatus) **10**, a client computer (also simply referred to as a client) **30**, a wearable terminal **50**, and a server computer (also simply referred to as a server) **70**.
[0054] The elements **10**, **30**, **50**, and **70** in the present system **1** are connected to each other so as to communicate with each other via a network **108**. The network **108** is configured by a local area network (LAN), the Internet, and the like. Further, the manner of connection to the network **108** may be a wired connection or a wireless connection. For example, the wearable terminal **50** is connected to the network **108** by wireless connection (wireless communication by a wireless LAN (e.g., IEEE 802.11) or the like), and the MFP **10** and the server **70** are connected to the network **108** by wired connection.
[0055] Further, the MFP **10** and the wearable terminal **50** can communicate with the server **70** via the network **108**. Further, the client **30** can communicate with the MFP **10**, the wearable terminal **50**, the server **70**, or the like via the network **108**.
[0056] Further, the MFP **10** and the wearable terminal **50** are wirelessly connected to each other using various wireless communication techniques. For example, short-range wireless communication can be used for communication between the MFP **10** and the wearable terminal **50** in addition to the above-described communication by a wireless LAN (e.g., IEEE 802.11). For example, communication based on Bluetooth Low Energy (Bluetooth (registered trademark) LE), near field radio communication (NFC), or the like is used as the short range wireless communication.

1-2. Configuration of Image Processing Apparatus

[0057] FIG. **2** shows functional blocks of the image processing apparatus **10**. Here, a multi-functional peripheral (MFP) is exemplified as the image processing apparatus **10**. Functional blocks of the MFP **10** are shown in FIG. **2**.
[0058] The MFP **10** is an apparatus (also referred to as a multi-functional peripheral) having a scan function, a copy function, a facsimile function, a box storage function, and the like. Specifically, as shown in the functional block diagram of FIG. **2**, the MFP **10** includes an image reading unit **2**, a printout unit **3**, a communication unit **4**, a storage unit **5**, an operation unit **6**, a controller **9**, and the like, and achieves various functions by operating these units in a combined manner. The MFP **10** is also referred to as an image forming apparatus.
[0059] The image reading unit **2** is a processing unit that optically reads (i.e., scans) an original document placed on a predetermined position (e.g., an auto document feeder (ADF) or a glass surface) of the MFP **10** and generates image data of the original document (such data will also be

referred to as an original image or a scanned image). This image reading unit **2** is also referred to as a scan unit.

[0060] The printout unit **3** is an output unit that prints and outputs an image on various media, such as paper, on the basis of data concerning the printing target.

[0061] The communication unit **4** is a processing unit capable of performing facsimile communication via a public line or the like. Furthermore, the communication unit **4** can also perform various types of wireless communication. Specifically, the communication unit **4** includes a wireless LAN communication section **4***a* that performs wireless communication using a wireless LAN (e.g., IEEE 802.11) and a short-range wireless communication section **4***b* that performs wireless communication (short-range wireless communication) by Bluetooth LE or the like.

[0062] The storage unit **5** is configured of a storage device such as a hard disk drive (HDD).

[0063] The operation unit **6** includes an operation input section **6***a* for accepting an operation input to the MFP **10** and a display section **6***b* for performing display output of various types of information.

[0064] The MFP **10** is provided with a substantially plate-shaped operation panel section **6***c* (see FIG. **1**). Further, the operation panel section **6***c* has a touch panel **25** (see FIG. **1**) on a front side thereof. The touch panel **25** functions as a part of the operation input section **6***a* and also functions as a part of the display section **6***b*. The touch panel **25** is configured by embedding various sensors and the like in a liquid crystal display panel, and can display various types of information, and can accept various operation inputs from the operator.

[0065] The controller **9** is a control device built in the MFP **10** to comprehensively control the MFP **10**. The controller **9** is configured as a computer system including a CPU, and various semiconductor memories (e.g., a RAM and a ROM), and the like. The controller **9** achieves various processing units by executing a predetermined software program (hereinafter, also simply referred to as a program) stored in a ROM (e.g., EEPROM (registered trademark)) in the CPU. The program (specifically, a program module group) may be recorded in a portable recording medium such as a USB memory (in other words, various types of non-transitory computer-readable recording media), and read out from the recording medium to be installed in the MFP **10**. Alternatively, the program may be downloaded via a network to be installed in the MFP **10**.

[0066] As shown in FIG. **2**, specifically, the controller **9** executes the above program so as to achieve various types of processing sections including a communication control section **11**, an input control section **12**, a display control section **13**, a voice input/output control section **14**, an authentication processing section **15**, a job control section **16**, and a job history management section **17**.

[0067] The communication control section **11** is a processing section that cooperates with the communication unit **4** and the like to control a communication operation with another apparatus (e.g., the server **70**). The communication control section **11** has a transmission control section for controlling the transmitting operation of various kinds of data and a reception control section for controlling the receiving operation of various kinds of data.

[0068] The input control section **12** is a control section that controls functioning of operation input to the operation input section **6***a* (e.g., the touch panel **25**). For example, the input control section **12** controls functioning of accepting an operation input (e.g., a designation input from the user) on the operation screen displayed on the touch panel **25**.

[0069] The display control section **13** is a processing section that controls the display operation on the display section **6***b* (e.g., the touch panel **25**). The display control section **13** causes the touch panel **25** to display an operation screen or the like for operating the MFP **10**.

[0070] The voice input/output control section **14** is a processing section that controls voice input processing by a voice input section (e.g., a microphone (not shown) built in the image processing apparatus **10**), voice output processing by a voice output section (e.g., a speaker (not shown) built in the image processing apparatus **10**), and the like.

[0071] The authentication processing section **15** is a processing section that controls authentication processing (login processing) of the user.

[0072] The job control section **16** is a processing section that controls operations (e.g., a printout operation and a scan operation) concerning various types of jobs.

[0073] The job history management section **17** is a processing section that manages the history of various types of jobs. The job history management section **17** transmits the job history (operation information) of the MFP **10** to the server **70** in cooperation with the communication control section **11** and the like.

1-3. Configuration of Wearable Terminal **50**

[0074] Next, the configuration of the wearable terminal (also referred to as a wearable device) **50** will be described.

[0075] The wearable terminal **50** is a device capable of performing operation in cooperation with the MFP **10** (image processing apparatus). Specifically, the wearable terminal **50** is an information input/output terminal device (information terminal) capable of wireless communication (short-range wireless communication and network communication) with the MFP **10**.

[0076] Further, the wearable terminal **50** can perform a cooperative operation with the server **70**. Specifically, the wearable terminal **50** transmits the biological information (described below) obtained by detection by the wearable terminal **50** to the server **70** via wireless communication (short-range wireless communication and network communication) or the like.

[0077] The wearable terminal **50** is a biological information detector that obtains biological information on the user by detection (measurement) (more specifically, biological information that changes depending on the state of the user (namely, dynamic biological information)). This embodiment exemplifies, as the wearable terminal **50**, a device capable of detecting (measuring) the user's blood pressure as biological information on the user. However, the present invention is not limited to this example. The wearable terminal **50** may be a device that obtains biological information other than a blood pressure by detection (measurement) (e.g., a pulse wave, an electrocardiogram, a body temperature, and/or a heart rate). The biological information is information that changes over time depending on the mental state and/or physical condition of the user. It should be noted that the wearable terminal **50** is also referred to as a user state detector or the like that detects a user's mental state or the like by using the biological information on the user.

[0078] This embodiment exemplifies a wristband type (wrist-mounted type) device as the wearable terminal **50**.

However, the present invention is not limited to this example, and various types of devices can be used as the wearable terminal **50**.

[0079] FIG. **3** is a functional block diagram showing a schematic configuration of the wearable terminal **50**.

[0080] As shown in the functional block diagram of FIG. **3**, the wearable terminal **50** includes a communication unit **54**, a storage unit **55**, an operation unit **56**, a biological information detection unit **57**, a battery **58**, a controller **59**, and the like, and operates these units in a combined manner, thereby achieving various functions.

[0081] The communication unit **54** can perform various types of wireless communication (including wireless communication by Bluetooth LE, and other communications). Specifically, the communication unit **54** includes a wireless LAN communication section **54***a* that performs wireless communication using a wireless LAN (e.g., IEEE 802.11) and a short-range wireless communication section **54***b* that performs wireless communication (short-range wireless communication) by Bluetooth LE or the like.

[0082] The storage unit **55** is configured by a storage device such as a nonvolatile semiconductor memory.

[0083] The biological information detection unit **57** is configured to include various sensors for obtaining biological information on blood pressure or the like by detection.

[0084] The battery **58** is a secondary battery (rechargeable battery), and supplies power to the wearable terminal **50**.

[0085] The operation unit **56** includes an operation input section **56***a* for accepting an operation input to the wearable terminal **50** and a display section **56***b* for display output of various types of information. The wearable terminal **50** is provided with a touch panel in which various sensors and the like are embedded in a liquid crystal display panel. The touch panel functions as a part of the operation input section **56***a* and also functions as a part of the display section **56***b*.

[0086] The controller **59** shown in FIG. **3** is a control device built in the wearable terminal **50** to comprehensively control the wearable terminal **50**. The controller **59** is configured as a computer system including a CPU, various semiconductor memories (e.g., a RAM and a ROM), and the like. The controller **59** achieves various processing units by executing a predetermined software program (hereinafter also simply referred to as a program) stored in the storage unit (e.g., semiconductor memory) in the CPU. The program (specifically, a program module group) may be recorded in a portable recording medium such as a USB memory (in other words, various types of non-transitory computer-readable recording media), and may be read out from the recording medium to be installed in the wearable terminal **50**. Alternatively, the program may be downloaded via a network or the like to be installed in the wearable terminal **50**.

[0087] The wearable terminal **50** has, for example, a program installed therein for cooperating with the server **70**, the MFP **10**, and the like (program for cooperation). The program for cooperation is an application software program (also simply referred to as an application) for achieving various types of processing (e.g., processing of detecting a user's state (biological information), and processing of transmitting the user's state).

[0088] Specifically, the controller **59** achieves various processing units including a communication control section **61**, an input control section **62**, a display control section **63**, a state detection section **65**, and an operation executing section **66**, by executing the cooperation program and the like.

[0089] The communication control section **61** is a processing section that cooperates with the communication unit **54** and the like, to control the communication operation with the server **70** and the like.

[0090] The input control section **62** is a control section that controls functioning of operation input to the operation input section **56***a* (e.g., a touch panel).

[0091] The display control section **63** is a processing section that controls a display operation on the display section **56***b* (e.g., a touch panel).

[0092] The state detection section **65** is a processing section that obtains the biological information on the user by detection (measurement) by cooperating with the biological information detection unit **57**.

[0093] The operation executing section **66** is a processing section that comprehensively executes various cooperative operations with the server **70** (or the MFP **10**).

1-4. Configuration of Server **70**

[0094] The server computer **70** (also simply referred to as a server) is a computer that acquires information on each job in the MFP **10** (operation information on the MFP **10** (job history information)) and biological information on the user executing each job, or the like, and store these pieces of information and the like.

[0095] Specifically, the server **70** stores biological information (biological information on each user) obtained by detection by the wearable terminal **50** and transmitted from the wearable terminal **50**.

[0096] Further, the server **70** stores job executing information (also referred to as job history information, operation information, or the like) transmitted from each MFP **10**.

[0097] FIG. **4** is a functional block diagram showing a schematic configuration of the server **70**. The server **70** is also referred to as a management server (management server of the present system **1**) that manages the MFP **10** and the like. The server **70** may be a server provided in a business place where the MFP **10** is disposed or a server provided outside the business place (e.g., a cloud server).

[0098] As shown in the functional block diagram of FIG. **4**, the server **70** includes a communication unit **74**, a storage unit **75**, an operation unit **76**, a controller **79**, and the like, and operates these units in a combined manner, thereby achieving various functions.

[0099] The communication unit **74** can perform various types of communication.

[0100] The storage unit **75** is configured by a storage device such as an HDD and a nonvolatile semiconductor memory. The storage unit **75** stores information on the user of the present system **1** (user of each MFP **10**) (user information), information on a layout (layout information) in a room in which the present system **1** is introduced, and the like in advance. In addition, the storage unit **75** stores the operation information on each MFP **10** and the biological information on each user (updated as needed).

[0101] The operation unit **76** includes an operation input section **76***a* for accepting an operation input to the server **70** and a display section **76***b* for displaying output of various types of information.

[0102] The controller **79** in FIG. **4** is a control device built in the server **70** to comprehensively control the server **70**.

The controller **79** includes a CPU, various semiconductor memories (e.g., a RAM and a ROM), and the like. The controller **79** achieves various processing units by executing a predetermined software program (hereinafter also simply referred to as a program) stored in the storage unit (e.g., a semiconductor memory) in the CPU. The program (specifically, a program module group) may be recorded in a portable recording medium such as a DVD-ROM or a USB memory (in other words, various types of non-transitory computer-readable recording media), and read out from the recording medium to be installed in the server **70**. Alternatively, the program may be downloaded via a network or the like to be installed in the server **70**.

[0103] The server **70** has a program (e.g., an analysis program) installed therein for executing analysis processing and the like concerning the image processing system **1**. The analysis program is an application software program (also referred to simply as an application) for achieving processing of acquiring the state of the user (biological information) and an operation history (operation information) of the MFP **10**, or the like and achieving processing of analyzing the user's state.

[0104] Specifically, the controller **59** achieves various processing sections including a communication control section **81**, an input control section **82**, a display control section **83**, a voice input/output control section **84**, an analysis section **85**, and an acquiring section **86** by executing the analysis program and the like.

[0105] The communication control section **81** is a processing section that cooperates with the communication unit **74** and the like to control the communication operation with the MFP **10**, the wearable terminal **50**, and the like.

[0106] The input control section **82** is a control section that controls functioning of operation input to the operation input section **76***a* (e.g., a touch panel).

[0107] The display control section **83** is a processing section that controls a display operation on the display section **76***b* (e.g., a touch panel).

[0108] The voice input/output control section **84** is a processing section that controls voice input processing by a voice input section (e.g., a microphone (not shown) built in the server **70**) and voice output processing by a voice output section (e.g., a speaker (not shown) built in the server **70**) and the like.

[0109] The acquiring section **86** is a processing section that acquires operation information (operation history information) of each MFP **10**. The operation information acquired by the acquiring section **86** is stored in the storage unit **75**.

[0110] The acquiring section **86** also acquires the biological information on each user. The biological information acquired by the acquiring section **86** is stored in the storage unit **75**.

[0111] The analysis section **85** is a processing section that analyzes the stress (specifically, presence or absence of stress, occurrence period of stress, and the like) of each user regarding the use of each MFP **10** on the basis of the information (biological information and operation information) acquired by the acquiring section **86**.

[0112] The analysis result obtained by the analysis section **85** is displayed on the display section **76***b*.

[0113] It should be noted that the server **70** is an apparatus that executes analysis processing of stress of each user and the like, and is also referred to as an analyzing apparatus or the like.

1-5. Other Devices

[0114] A client computer (also simply referred to as a client) **30** (see FIG. **1**) is a computer capable of giving a printout command (e.g., a so-called PC print command) to the MFP **10**.

[0115] For example, the client **30** can execute security printing in cooperation with the MFP **10**.

[0116] Specifically, the client **30** transmits a print job (including printout data) concerning a desired document to the MFP **10** in response to an operation by the user U**1** and allows the MFP **10** to store the printout data temporarily. Then, after moving to the installation location of the MFP **10** and logging in to the MFP **10**, the user U**1** can allow the MFP **10** to perform printing output regarding the document in response to an operation using the operation panel section **6***c* of the MFP **10**.

1-6. Operation Outline

[0117] FIG. **5** is a conceptual diagram showing the operation in the present system **1**.

[0118] Each user (U**1**, U**2**, U**3**, . . .) wears corresponding wearable terminal **50** (**50***a*, **50***b*, **50***c*, . . .) (see also FIG. **1**). In other words, each of the wearable terminals **50** is worn by the corresponding user.

[0119] Each wearable terminal **50** acquires the biological information on each user (corresponding user) at intervals of a predetermined time period (e.g., 30 seconds), and stores (accumulates) the biological information in the storage unit **55** of each wearable terminal **50**. Upon lapse of a certain period of time (e.g., one hour), each wearable terminal **50** transmits the biological information accumulated during the certain period to the server **70**. In other words, each wearable terminal **50** periodically uploads the biological information in the wearable terminal **50** to the server **70**, and the server **70** acquires the biological information obtained by measurement by each wearable terminal **50** worn by the corresponding user, from the wearable terminal **50** by periodic communication. By repeating such operations, the biological information on each user is put together (stored) in the server **70**.

[0120] In addition, each of the MFPs **10** (**10***a*, **10***b*, . . .) stores (accumulates) operation information (operation history) on the MFP **10** based on the operation of corresponding user in the storage unit **5** in the MFP **10**. Then, upon lapse of a certain period of time (e.g., one hour), each MFP **10** transmits the operation information accumulated during the certain period to the server **70**. In other words, the MFP **10** periodically uploads the operation information in the MFP **10** to the server **70**, and the server **70** acquires the operation information (job history information) on each MFP **10** from each MFP **10** by periodic communication. By repeating such operations, the operation information on each MFP **10** is put together (stored) in the server **70**.

[0121] The server **70** analyzes the stress of the user regarding the use of the MFP **10** (presence/absence of occurrence of the stress, stress occurrence period, and the like) on the basis of the biological information and the operation information acquired in this way. Then, the server

70 outputs the analysis result. The analysis processing may be executed at a point in time when a certain amount of data has been collected (e.g., at a point in time when a certain period (e.g., one month) has elapsed from the start of collection, or the like).

1-7. Detailed Operation

[0122] Next, an example of the analysis operation will be described in more detail.

[0123] In the first embodiment, among the plurality of MFPs **10** (specifically, two MFPs **10***a* and **10***b*), the presence or absence of an MFP having a problem when the MFP is used by a certain user U**1** is analyzed.

[0124] <Job Information>

[0125] Therefore, the server **70** extracts operation information on the user U**1** from the operation information (job history information on each of the MFPs **10***a* and **10***b*) collected by the server **70** from each of the MFPs **10** (**10***a* and **10***b*). FIG. **6** shows such information (extracted operation information). In each figure, the MFP **10***a* (Unit No. **1**) is also referred to as "MFP_A" and the MFP **10***b* (Unit No. **2**) is also referred to as "MFP_B" for convenience.

[0126] In this operation information, the user (user name (user ID)) executing each job Ji, the execution apparatus (MFP name (apparatus ID)) of each job, and the type of each job are specified for each of a plurality of jobs Ji. In the operation information, login time (T**1**), job start time (T**2**), job end time (T**3**), and logout time (T**4**) concerning each job Ji are also specified for each of the plurality of jobs Ji.

[0127] For example, with respect to the job J**1** of "No. **1**" in the uppermost row in FIG. **6**, its execution user ("user U**1**"), its execution apparatus ("Unit No. **1** (MFP **10***a*)") and its type ("copy" job) are specified. Also, the login time T**1** ("2016/3/1 10:00"), job start time T**2** ("2016/3/1 10:01"), job end time T**3** ("2016/3/1 10:04"), and logout time T**4** ("2016/3/1 10:09") concerning the job are also specified. Although not shown in FIG. **6** and the like, each time is recorded up to "second" in addition to "year, month, day", "hour", and "minute".

[0128] In addition, when two or more jobs are executed (successively) during a login period after one login operation, the time of the one login operation (login time) is defined as the login time of each of the two or more jobs (same login time). This also applies to the logout time.

[0129] For example, the two jobs J**2** and J**3** of "No. **2**" and "No. **3**" are successively executed during a login period after one login operation, and the same login time ("2016/3/1 10:59") and the same logout time ("2016/3/1 11:15") are defined for the two jobs J**2** and J**3**.

[0130] Further, the server **70** recognizes the period from the login time to the logout time for each job Ji as the usage period of the MFP **10** for each job Ji (see FIG. **7**).

[0131] For example, with respect to the job J**1** of "No. **1**", its login time ("2016/3/1 10:00") is defined as the use start time of the MFP, and its logout time ("2016/3/1 10:09") is defined as the use end time of the MFP.

[0132] <Biological Information and Combined Information>

[0133] Further, the server **70** extracts biological information (biological information transmitted from the wearable terminal **50***a*) on the user U**1** from the biological information collected by the server **70** from each of the wearable terminals **50** (**50***a*, **50***b*, . . .). Further, the server **70** extracts biological information of a period (extraction target period) corresponding to each job based on the operation of the user U**1**, out of the extracted biological information on the user U**1**. More specifically, the biological information in the period including the use period (T**1** to T**4**) of the MFP concerning each job and the predetermined period (T**0** to T**1**) (e.g., 1 to 2 minutes) immediately before the start of the use period is extracted as the biological information of the extraction target period (T**0** to T**4**).

[0134] FIGS. **8** to **12** show such information (extracted information). FIG. **8** shows the biological information in the extraction target period concerning the job J**1** of "No. **1**". FIGS. **9** to **12** show biological information in the extraction target period concerning the jobs (J**2** to J**5**) of "No. **2**" to "No. **5**", respectively.

[0135] FIGS. **14** to **18** are figures corresponding to FIGS. **8** to **12**, respectively. In FIGS. **14** to **18**, the login time T**1**, job start time T**2**, job end time T**3**, and logout time T**4** of each job Ji are incorporated (combined) in the corresponding diagrams of FIGS. **8** to **12**. The jobs J**1** to J**3** (FIGS. **14** to **16**) are jobs executed by the MFP **10***a*, and the jobs J**4** and J**5** (FIGS. **17** and **18**) are jobs executed by the MFP **10***b*.

[0136] For example, as can be seen by comparing FIG. **8** with FIG. **14**, information on the login time T**1** ("2016/3/1 10:00:17"), job start time T**2** ("2016/3/1 10:01:05"), job end time T**3** ("2016/3/1 10:04:46"), logout time T**4** ("2016/3/1 10:09:46") is incorporated in the time series data on each biological information with respect to the job J**1** of "No. **1**".

[0137] <Stress Determination>

[0138] Further, whether each user feels stress or the like is determined in the following manner.

[0139] Specifically, in a case where a measurement result relating to biological information (blood pressure value (more accurately, maximum blood pressure value)) has been obtained with respect to a certain user U**1**, statistical processing is performed on a plurality of measured values (blood pressure values). Here, it is assumed that calculation has been made so that the average value of the plurality of measured values is "120.2" (mmHg) and the standard deviation σ is "11.5". In this case, for example, when the measured value is equal to or more than "131.7" (=threshold value TH**1**=(average value+standard deviation)=120.2+11.5) (mmHg), it is determined that the user feels stress.

[0140] In this manner, it is determined that the period during which the predetermined index value (in this case, the blood pressure value) relating to the biological information is greater than the normal value (average value) by a predetermined degree (e.g., value σ) or more is a period during which the user feels stress (also referred to as a stress period). That is, it is determined that a period during which a predetermined index value relating to biological information (in this case, blood pressure value) has a value outside a predetermined reference range is a stress period.

[0141] In other words, on condition that the predetermined index value related to the biological information has a value outside the predetermined reference range, it is determined that the state in which the user feels stress related to the MFP **10** (image processing apparatus) (also referred to as "apparatus-related stress state") has occurred. In this embodiment, when the predetermined index value related to the biological information has a value outside the predetermined reference range, it is always determined that the "apparatus-related stress state" has occurred.

[0142] In addition, in this embodiment, the operation period (use period for each job) of each of the plurality of

MFPs **10** is divided into a plurality of periods (here, four periods M**1** to M**4**) according to the progress steps of the operation of each MFP **10** (see e.g., FIGS. **14** and **24**). The periods M**1** to M**4** are also referred to as "sectional period" or the like.

[0143] Specifically, the first period M**1** is the period from a time point (time) T**0** that is earlier than the login time T**1** by a predetermined time period (e.g., 2 minutes) to the login time T**1**. The second period M**2** is the period from the login time T**1** to the job start time T**2**. The third period M**3** is the period from the job start time T**2** to the job end time T**3**. The fourth period M**4** is the period from the job end time T**3** to the logout time T**4**. In this manner, the plurality of periods (the sectional periods) M**1** to M**4** are defined by being divided using a plurality of time points including the time T**0**, the login time T**1**, the job start time T**2**, the job end time T**3**, and the logout time T**4**.

[0144] Further, when two or more jobs are executed (successively) during a login period by one login operation, it is sufficient if the period spanning two successive jobs is divided into two. For example, when two jobs J**2** and J**3** are executed successively during a certain login period, a period from the end time T**3** of the job J**2** (see FIG. **15**) to the start time T**2** of the next job J**3** (see FIG. **16**) are further divided into two periods (e.g., a front side period and a rear side period). Then, the front side period (T**3** to "11:04:00") may be regarded as the sectional period M**4** of the job J**2** and the rear side period ("11:04:00" to T**2**) may be regarded as the sectional period M**2** of the job J**3**. Further, it may be deemed that there is no sectional period M**1** of the job J**3**.

[0145] In each of the above embodiments, the plurality of periods M**1** to M**4** are defined by dividing the operation period in each MFP **10** using the time T**0**, the login time T**1**, the job start time T**2**, the job end time T**3**, and the logout time T**4**, but the present invention is not limited to the definition. Specifically, the plurality of periods (the sectional periods) generated by dividing the operation period of each MFP **10** can be defined by using a plurality of time points including at least one of the login time T**1**, the job start time T**2**, the job end time T**3**, and the logout time T**4**.

[0146] For example, two periods (T**1** to T**2**, and T**2** to T**3**) may be defined by dividing the operation period of the MFP **10** by using the login time T**1**, the job start time T**2**, and the job end time T**3**. Alternatively, two periods (T**2** to T**3**, and T**3** to T**4**) may be defined by dividing the operation period of the MFP **10** by using the job start time T**2**, the job end time T**3**, and the logout time T**4**. Alternatively, a plurality of periods M**1** to M**5** may be defined by dividing the operation period of the MFP **10** by using the time T**5** when a predetermined time period has passed after the logout time T**4**. The period M**5** is a period from the logout time T**4** to the time T**5**.

[0147] When a plurality of sectional periods (here, M**1** to M**4**) are generated, it is determined whether each of the plurality of periods (sectional periods) M**1** to M**4** is a "stress existence period" (a period where stress of the user (specifically, the user stress related to the image processing apparatus) is present). To put it briefly, presence or absence of occurrence of stress (in detail, occurrence of "apparatus-related stress state") is determined, with each of the plurality of periods M**1** to M**4** as one unit. Here, whether a period Mi is a stress existence period is determined on the basis of whether a measurement result (blood pressure value) larger than the threshold value TH**1** ("131.7") is included in each of the periods M**1** to M**4**. In other words, whether each of the sectional periods M**1** to M**4** is the "stress existence period" is determined on the basis of whether each of the sectional periods M**1** to M**4** includes a period (stress period) during which the user feels stress (in detail, stress relating to the image processing apparatus). To put it briefly, the sectional period during which the "apparatus-related stress state" occurs is determined to be the "stress existence period" among the plurality of sectional periods M**1** to M**4**.

[0148] For example, since the period M**3** of the job J**1** includes three measurement values ("133", "135", and "132") larger than the threshold value TH**1** as shown in FIG. **14**, the period M**3** is determined to be the "stress existence period". It is also determined that the apparatus causing this stress is the MFP **10***a* on the basis of FIG. **7** or the like.

[0149] Stress analysis processing is executed on the basis of such a determination criterion and the like.

[0150] Specifically, the server **70** executes analysis processing concerning whether each of the plurality of periods M**1** to M**4** is a "stress existence period", or the like. Further, the plurality of MFPs **10** are distinguished from each other and the analysis processing is executed. More specifically, whether each of the plurality of periods M**1** to M**4** is a "stress existence period" is determined by analysis for each MFP **10**. The analyzing processing is performed based on the biological information on the user U**1**, the operation information on the plurality of MFPs **10***a* and **10***b*, and the like.

[0151] Here, stress of the user in each of the periods M**1** to M**4** is considered to be caused in many cases by circumstances peculiar to the respective periods M**1** to M**4** (see e.g., FIG. **24**).

[0152] For example, it is presumed that the stress of the user U**1** during the period M**3** (the job start time T**2** to the job end time T**3**) is a stress caused by a feeling that time from the job execution start to the job execution end is long. More specifically, it is presumed that the user is feeling stress due to the fact that the printout speed and/or the scan speed, and the like is slower than the user's expectation.

[0153] Further, it is presumed that the stress during the period M**1** (the time T**0** to the login time T**1**) is caused by the movement of the user before logging in. For example, it is estimated that the distance from the seat of the user U**1** to the installation location of the MFP **10** is greater than a predetermined degree (exceeding the tolerable limit of the user U**1**). To put it briefly, a situation where the installation location of the MFP **10** is far from the seat of the user U**1** is estimated.

[0154] Further, it is presumed that the stress in the period M**2** (the login time T**1** to the job start time T**2**) is caused by a setting operation performed from the login to the job start. For example, it is presumed that the user U**1** is feeling a stress because a certain operation screen is hard to use.

[0155] In addition, it is presumed that the stress during the period M**4** (the job end time T**3** to the logout time T**4**) is caused by the fact that the user who has confirmed the processing result of the job at the time of the job end feels dissatisfied with the processing result.

[0156] In consideration of such circumstances, the location of the problem can be clarified by counting the number of times of stress existence for each period M**1** to M**4** according to the progress stage of the processing.

[0157] <Counting Operation>

[0158] The analysis processing is executed with a plurality of jobs by the user U1 as processing targets, and the number of such "stress existence periods" is counted (totalized) for a plurality of jobs.

[0159] FIG. **19** is a flowchart showing a partial operation (count operation) of the analysis processing in the server **70**.

[0160] First, the processing target data Dn is selected. Initially, data concerning the job J1 of "No. 1" (FIG. **14**) is selected as the processing target data Dn (D1). Then, whether the processing target data Dn includes "stress period" is determined (step S11).

[0161] When "stress period" is not included in the processing target data Dn, the processing proceeds to step S20.

[0162] On the other hand, when "stress period" is included in the processing target data Dn, the processing proceeds to steps S12 to S15.

[0163] In each of steps S12 to S15, whether "stress period" is included ("apparatus-related stress state" occurs) in each of the aforementioned periods (sectional periods) M1 to M4 is determined. In other words, whether each period M1 to M4 is a "stress existence period" is determined. Then, the counting processing (totalizing processing for each sectional period) is performed in steps S16 to S19 on the basis of the determination result. Thereafter, the processing proceeds to step S20.

[0164] Specifically, when the period M1 is "stress existence period", the counter "i_move" is incremented (step S16). When the period M2 is "stress existence period", the counter "i_job_setting" is incremented. When the period M3 is "stress existence period", the counter "i_wait" is incremented, and when the period M4 is "stress existence period", the counter "i_check" is incremented. Each counter is prepared for each MFP, and the totalizing processing is performed for each MFP.

[0165] In step S20, the data number n is incremented, and the determination of end is made in step S21. When the value (n−1) is smaller than the total number of records (the total number of jobs), in other words, when unprocessed data remains, the processing returns from step S21 to step S11 and the same operation is repeated again. On the other hand, when it is determined that the value (n−1) has reached the total number of records (the total number of jobs), the counting processing of FIG. **19** ends.

[0166] <Output of Counting Result>

[0167] FIG. **20** shows the result of the totalizing processing (counting result) as described above in a tabular form.

[0168] It is shown that the user U1 feels stress in "four" periods M3 in the job using the MFP **10***a*. In other words, the user U1 feels stressed by the "four" jobs using the MFP **10***a* in the sectional period M3.

[0169] Likewise, it is shown that the user U1 feels stress in "two" periods M4 in the job using the MFP **10***a*. In other words, the user U1 feels stressed by the "two" jobs using the MFP **10***a* in the sectional period M4.

[0170] Further, it is shown that the user U1 feels stress in "three" periods M1 in the job using another MFP **10***b* and the user U1 feels stress in "one" period M2 in the job using the MFP **10***b*.

[0171] Such counting results are displayed on the display section **76***b* of the server **70** in a tabular form as shown in FIG. **20**. However, the present invention is not limited to this, and the result may be displayed in a graph form as shown in FIG. **21** or the like. In this manner, the counting result (analysis result) is displayed on the display section **76***b* using a display screen including a table or a graph, for example.

[0172] Then, the administrator (e.g., a management user) or the like can recognize the problem in each MFP by confirming the counting result (analysis result) on the display section **76***b* or the like.

[0173] For example, the administrator can confirm that the cumulative number of "stress existence periods" with respect to the period M3 is equal to or more than a predetermined number (e.g., two) in the MFP **10***a* and recognizes the problem point (dissatisfaction factor of the user U1) that the time from the start of job execution to the end of job execution (waiting time for the processing) is felt to be long. Because of this, the administrator can also recognize that it is preferable to improve the processing capacity of the MFP **10***a*.

[0174] Further, the administrator can confirm that the cumulative number of "stress existence periods" with respect to the period M1 is equal to or more than a predetermined number (e.g., two) in the MFP **10***b*, and can recognize the problem point (dissatisfaction factor of the user U1) that there is a problem in the movement time until login. Because of this, the administrator can also recognize that it is preferable to change the location of the MFP **10***b*.

[0175] <Presentation of Improvement Measures>

[0176] Furthermore, the server **70** also presents improvement proposals (improvement measures) to the administrator and the like. For example, when a bar graph portion (see FIG. **21**) displayed on the display section **76***b* for each counting result of each period is pressed (clicked with a mouse or the like), improvement proposal regarding each period is further displayed on the display section **76***b*.

[0177] Specifically, when the bar graph portion corresponding to the period M3 of the MFP **10***a* is pressed, the server **70** displays words or the like meaning that the processing capability of the MFP **10***a* should be improved, on the display section **76***b*, based on the fact that the user U1 feels stress during the period M3. When the bar graph portion corresponding to the period M1 of the MFP **10***b* is pressed, the server **70** displays words or the like meaning that the installation location of the MFP **10***b* or the seat position of the user U1 should be changed, on the display section **76***b*, based on the fact that the user U1 feels stress during the period M1.

[0178] By accomplishing improvement based on the improvement proposal, it is possible to prevent lower productivity or to improve productivity.

[0179] In addition, it is preferable that the layout drawing as shown in FIG. **13** is further displayed (e.g., superimposedly displayed) in relation to the above analysis result (specifically, analysis result concerning the period M1). In the layout drawing of FIG. **13**, the positional relationship (the positional relationship in the room) between the seat position of the user U1 and the installation location of the MFP **10***b* (and the MFP **10***a*) is shown. By the display of the analysis result using the layout drawing (the layout is displayed in association with the analysis result), the administrator can easily recognize that the seat position of the user U1 is relatively far apart from the MFP **10***b* (compared to other users including the user U8).

1-8. Effect of First Embodiment

[0180] According to the above-described first embodiment, the stress of the user regarding the use of the MFP **10** (more specifically, presence or absence of the occurrence, period of the occurrence, or the like) are analyzed on the basis of the biological information on the user U**1** obtained by detection by the wearable terminal **50** and the operation information on the MFPs **10***a* and **10***b*, and then the analysis results are output (see e.g., FIGS. **20** and **21**). Hence, current state analysis (analysis processing for current state) on the image processing system can be performed relatively easily without necessarily conducting a hearing survey.

[0181] In particular, by correlating the biological information on the user with the operation information on the MFP **10**, a reduction in productivity that appears as a user's stress can be detected more easily.

[0182] In addition, based on the biological information on the user U**1** and the operation information on the plurality of MFPs **10***a* and **10***b*, whether each of the plurality of sectional periods M**1** to M**4** is a stress existence period is determined by analysis for each of the plurality of MFPs **10***a* and **10***b*. Therefore, information on a plurality of MFPs **10***a* and **10***b* used by a certain user U**1** can be acquired efficiently.

[0183] In the above embodiment, the server **70** divides the operation period in the MFP **10** into a plurality of periods M**1** to M**4** according to the progress steps of the operation, and determines whether each of the plurality of periods M**1** to M**4** is a stress existence period. By analyzing which of the plurality of periods M**1** to M**4** includes the stress of the user, the advantage of being able to easily identify the cause of the stress can be obtained.

[0184] In addition, since the analysis result is visualized in a tabular form and/or a graph form and presented to the user, the administrator can easily recognize the analysis result.

1-9. Modification Example of First Embodiment

[0185] <Apparatus Group Management>

[0186] It is preferable that the server **70** manages the plurality of MFPs **10** as one apparatus group (one group), and suggests improvement measures by mutually utilizing the information on the one apparatus group. In the server **70**, components (e.g., MFPs **10***a* and **10***b*) of the one apparatus group can be designated (registered) by using a registration screen (not shown) for registering a plurality of MFPs configuring one apparatus group.

[0187] Specifically, when it is determined that the user U**1** feels stress with respect to one MFP **10** (e.g., MFP **10***a*) in the one apparatus group, improvement measures for relieving the stress of the user U**1** may be proposed on the basis of the information on another MFP **10** different from the one MFP **10** in the one apparatus group.

[0188] For example, when a bar graph portion corresponding to the period M**3** of the MFP **10***a* is pressed, a display screen as shown in FIG. **22** is displayed on the display section **76***b* or the like. On the display screen, the words concerning the improvement proposal is also displayed in addition to the words (analysis result) "User U**1** feels stress from waiting time until processing completion of MFP **10***a* (Unit No. **1**)." Specifically, the words (words for improvement proposal) "Improvement of printing speed of MFP **10***a* to speed equal to or higher than speed of MFP **10***b* (Unit No. **2**) is proposed. (Replacement by a higher-speed apparatus is proposed.)" are displayed.

[0189] Here, as described above, the MFPs **10***a* and **10***b* are apparatuses of a group collectively managed by the server **70**, and configure one group in the present system **1**. When there is a "stress existence period" in one MFP **10***a* among the components **10***a* and **10***b* of the group, the server **70** may propose the improvement measures concerning the "stress existence period" as follows on the basis of information on the one group (one apparatus group).

[0190] Specifically, first, the cumulative number of stress occurrences on the user U**1** in the period (sectional period) M**3** which is the "stress existence period" (the total value of the number of jobs in which the user U**1** felt stress during the period M**3**) is obtained for each of the MFPs **10***a* and **10***b*. Then, among the plurality of MFPs **10***a* and **10***b* belonging to the one group, another MFP **10** having the cumulative number of stress occurrences in the period M**3** smaller than that of the one MFP **10***a* is searched for as the reference target apparatus. Here, the cumulative number of stress occurrences from the MFP **10***b* in the period M**3** is "0", which is less than the cumulative number of stress occurrences "4" from the MFP **10***a* in the period M**3** (see FIG. **20**). Accordingly, the server **70** identifies the MFP **10***b* as the reference target apparatus. Then, the server **70** proposes improvement measures concerning the stress existence period M**3** of the MFP **10***a*, based on the information (e.g., an apparatus performance and a location) on the reference target apparatus **10***b*. Specifically, the server **70** proposes that the MFP **10***a* should be changed with reference to the MFP **10***b* as an improvement measure. More specifically, on the basis that the sectional period corresponding to the "stress existence period" is "period M**3**" (the period between the start time T**2** of each job and the end time T**3** of each job), the server **70** proposes that the MFP **10***a* should be replaced by an apparatus having processing performance equal to or higher than that of the reference target apparatus **10***b*. For example, it is proposed to change the apparatus to one having a print processing speed (e.g., 20 sheets/minute or 30 sheets/minute) equal to or more than the processing speed of the reference target apparatus **10***b* (e.g., 20 sheets/minute). The display screen (FIG. **22**) described above is a display screen showing such a proposal.

[0191] Further, when a bar graph portion (see FIG. **21**) corresponding to the period M**1** of the MFP **10***b* is pressed, a display screen as shown in FIG. **23** is displayed on the display section **76***b* or the like. On the display screen, the words related to the improvement proposal are also displayed, in addition to the words (analysis result) "User U**1** feels stress when moving to installation location of MFP **10***b* (Unit No. **2**)." Specifically, the words (words for improvement proposal) "The installation location of MFP **10***b* is proposed to be changed to vicinity of installation location of MFP **10***a* (Unit No. **1**) or location having distance from user U**1** equivalent to the distance of MFP **10***a*." are displayed.

[0192] In other words, when there is a "stress existence period" (also referred to as a stress period) in one MFP **10***b* of the group of MFPs **10***a* and **10***b* managed collectively, the server **70** can propose an improvement measure concerning the "stress existence period" as follows based on the information on the one group (one apparatus group).

[0193] Specifically, first, the cumulative number of stress occurrences on the user U**1** in the period (sectional period) M**1** corresponding to the "stress existence period" (number of jobs in which the user U**1** has felt stress during the period M**1**) is counted for each MFP **10**. Then, another MFP **10**

having the cumulative number of stress occurrences in the period M1 less than that of the one MFP **10***b* is searched for as the reference target apparatus among the plurality of MFPs **10***a* and **10***b*. Here, the cumulative number of stress occurrences of the MFP **10***a* is "0" in the period M1, which is less than the cumulative number of stress occurrences "3" of the MFP **10***b* in the period M1 (see FIG. **20**). Therefore, the server **70** identifies the MFP **10***a* as the reference target apparatus. Then, the server **70** proposes an improvement measure concerning the stress existence period M1 of the MFP **10***b*, based on the information (e.g., an apparatus performance and a location) on the reference target apparatus **10***a*. Specifically, improvement measures are proposed on the basis of the fact that the sectional period corresponding to the "stress existence period" is the "period M1" (period between each login time T1 by the user and the time T0 that is earlier than each login time by a predetermined time period). More specifically, the server **70** proposes that the installation location of one MFP **10***b* should be changed with reference to the installation location of the reference target apparatus **10***a* as an improvement measure concerning the stress existence period of the MFP **10***b*. Specifically, it is proposed that the installation location of the MFP **10***b* (Unit No. **2**) should be changed to the vicinity of the installation location of the MFP **10***a* (Unit No. **1**) or a location whose distance from the user U1 is equivalent to the distance between the MFP **10***a* and the user U1. The display screen (FIG. **23**) described above is a display screen showing such a proposal. A proposal to change the seat position of the user U1 may be made.

[0194] In addition, in response to pressing of the lower right button **501** in the display screen of FIG. **23**, the above-described layout drawing as shown in FIG. **13** may be further displayed (e.g., superimposedly displayed). The present invention is not limited to thereto, and the layout drawing may be displayed together with the display screen in the display screen of FIG. **23**.

[0195] <Others>

[0196] In the first embodiment, the analysis processing is performed only for the user U1, but the present invention is not limited thereto, and similar analysis processing may be performed for another user U2 or the like. In other words, similar analysis processing may be performed for each of a plurality of users.

2. Second Embodiment

[0197] The second embodiment is a modification of the first embodiment. Hereinafter, differences from the first embodiment will be mainly described.

[0198] In the first embodiment, analysis processing (e.g., stress analysis processing) is performed with respect to a single user.

[0199] In the second embodiment, analysis processing (e.g., stress analysis processing) is performed with respect to a single MFP **10**. Specifically, upon use by a plurality of users (in detail, two users U7 and U8), whether a certain MFP **10***a* has a problem is determined by analysis. In other words, the presence or absence of a user having a problem in using a certain MFP **10***a* and the like is analyzed among the plurality of users. Specifically, whether each of the plurality of sectional periods M1 to M4 is a stress existence period is determined by analysis for each of a plurality of users, based on the operation information on the MFP **10***a* and the biological information on the plurality of users. Such a mode will be described in the second embodiment.

[0200] FIG. **27** shows operation information on the MFP according to the second embodiment, and FIG. **28** shows a use period of the MFP in each job. FIG. **29** is a layout drawing according to the second embodiment. Here, attention is paid to a single MFP **10***a* (see FIG. **29**).

[0201] The server **70** acquires (extracts) the operation information on the MFP **10***a* based on the operation information accumulated in the server **70**, as shown in FIG. **27** and the like.

[0202] Further, the server **70** extracts the biological information on the plurality of users to be analyzed (in this case, the users U7 and U8) from the biological information (biological information on many users) obtained by detection by each of the wearable terminals **50** (**50***a*, **50***b*, . . .) and collected (acquired) by the server **70**. Further, the server **70** extracts the biological information of the period (extraction target period) corresponding to each job of the MFP **10***a* from the extracted biological information on the users U7 and U8 (see FIGS. **30** to **34**).

[0203] FIGS. **30** to **34** show the biological information extracted in this way. FIG. **30** shows biological information in the extraction target period for the job J1 of "No. **1**" (biological information on the user U7 executing the job J1) in FIG. **27**. Similarly, FIGS. **31** and **32** show biological information in the extraction target period for the jobs J2 and J3 of "No. **2**" and "No. **3**" respectively (biological information on the user U7 executing the jobs J2 and J3) in FIG. **27**. FIGS. **33** and **34** show biological information in the extraction target period for the jobs J4 and J5 of "No. **4**" and "No. **5**" respectively (the biological information on the user U8 executing the jobs J4 and J5) in FIG. **27**. Biological information on the user U7 related to each corresponding job is shown in FIGS. **30** to **32**, and biological information on the user U8 related to each corresponding job is shown in FIGS. **33** and **34**.

[0204] FIGS. **35** to **39** are views corresponding to FIGS. **30** to **34**, respectively. In FIGS. **35** to **39**, the login time T1, the job start time T2, the job end time T3, and the logout time T4 of each job Ji are incorporated (combined) in the corresponding diagrams in FIGS. **30** to **34**. The biological information on the user U7 executing each of the jobs J1 to J3 and the operation information on the job based on the operation of the user U7 (specifically, the time points T1 to T4, and the like) are combined and shown in FIGS. **35** to **37**. Also, the biological information on the user U8 executing each of the jobs J4 and J5, and the operation information on the job based on the operation of the user U8 are combined and shown in FIGS. **38** and **39**.

[0205] The server **70** analyzes the convenience and the like of a plurality of users (specifically, the users U7 and U8) using the MFP **10***a* on the basis of these pieces of information.

[0206] Also in the second embodiment, analysis processing including the counting processing similar to in FIG. **19** is performed. However, each counter (e.g., i_move) is prepared for each user, and totalizing processing is performed for each user. In addition, here, it is assumed that the threshold value TH1 for determining whether the user feels stress is always the same value (fixed value "132"). However, the present invention is not limited to this, and the threshold value TH1 may be determined for each user (it may be different for each user). In other words, the reference

range regarding the predetermined index value related to the biological information may be different for each user. For example, the threshold value TH1 for the user U7 may be "132" and the threshold value TH1 for the user U8 may be "135".

[0207] FIG. **40** shows the counting result in a tabular format, and FIG. **41** shows the counting result in a graph form.

[0208] The administrator (management user) or the like can recognize the problem point in the MFP **10***a* by checking the counting result on the display section **76***b* or the like.

[0209] For example, the administrator can confirm that the cumulative number of "stress existence periods" of the user U7 with respect to the period M3 of the MFP **10***a* is equal to or greater than a predetermined number, and can recognize the problem point (dissatisfaction factor of the user U7) that the time from the start of job execution to the end of job execution (waiting time for processing) is felt to be long. In addition, the administrator can recognize that it is preferable to improve the processing capability of the MFP **10***a*.

[0210] Further, the administrator can confirm that the cumulative number of "stress existence periods" of the user U8 with respect to the period M1 of the MFP **10***a* is equal to or more than the predetermined number, and recognizes the problem point (the dissatisfaction factor of the user U8) that there is a problem in the movement time until login. Because of this, the administrator can also recognize that it is preferable to change the installation location of the MFP **10***a* or the seat position of the user U8.

[0211] Further, it is preferable that the server **70** presents also improvement proposals (improvement measures) to the administrator or the like. For example, based on the fact that the user U7 feels stress during the period M3, an improvement proposal that the processing capability of the MFP **10***a* should be improved may be displayed on the display section **76***b*. Further, based on the fact that the user U8 feels stress during the period M1, an improvement proposal that the installation location of the MFP **10***a* or the seat position of the user U8 should be changed may be displayed on the display section **76***b*.

[0212] When the counting result and/or the improvement proposal is displayed, it is preferable that a layout drawing as shown in FIG. **29** is also displayed on the display section **76***b* or the like and presented to the administrator or the like.

[0213] In the layout drawing of FIG. **29**, the positional relationship (the positional relationship in the room) between the seat position of the user U8 and the installation location of the MFP **10***a* is shown. By using the layout drawing, the administrator can easily recognize that the seat position of the user U8 is relatively distant from the installation location of the MFP **10***a* (compared to other users U1, U2, and the like).

[0214] <Other Counting Results>

[0215] FIGS. **42** and **43** show other counting results (another example) according to the second embodiment.

[0216] The administrator (management user) or the like can recognize the problem point concerning the MFP **10***a* by confirming the counting result on the display section **76***b* or the like.

[0217] For example, the administrator can confirm that the cumulative number of "stress existence periods" of the user U1 with respect to the period M3 of the MFP **10***a* is equal to or more than a predetermined number, and can recognize the problem point (dissatisfaction factor of the user U3) that the time (waiting time for processing) from the start of job execution until the completion of job execution is felt to be long. However, since the other users U2 to U8 do not feel stress in the period M3, it can be recognized that it is preferable to further study to determine whether improving the processing capacity of the MFP **10***a* is better or not.

[0218] In addition, the administrator can confirm that the cumulative number of "stress existence periods" regarding the MFP **10***a* in the period M1 is equal to or more than the predetermined number, and the problem point (dissatisfaction factor of users U3 and U7) that the movement time to login is dissatisfying can be recognized. Because of this, the administrator can also recognize that it is preferable to change the installation location of the MFP **10***a* or to change the seat position of the users U3 and U7 (change to a position close to the MFP **10***a*).

[0219] In general, it is preferable that the distance from each user to the MFP **10** is short, but it is difficult to shorten the distances from all users to the MFP **10**. In addition, each user feels stress with a different level from the movement to the installation location of the MFP **10**. Hence, the administrator can propose preferential change and the like of the seat position of the user (e.g., the user U7) who is apt to feel stress from the movement. More specifically, in a case where the user U7 feels stressed by the movement and the user U8 does not feel stressed by the movement (see e.g., FIG. **42**), the problem of the distance between each user and the installation location of the MFP **10** can be solved by moving only the seat of the user U7 (without moving the seat of the user U8). In other words, such proposal (improvement measure) can be devised by effectively utilizing the biological information of the wearable terminal **50**.

Effect of Second Embodiment

[0220] As described above, in the second embodiment, the user's stress from the use of a certain MFP **10***a* (more specifically, presence or absence of the occurrence, period of the occurrence, and the like) is analyzed and the analysis result is output, based on the biological information on a plurality of users obtained by detection by respective wearable terminals **50** and the operation information on the MFP **10***a* (see e.g., FIGS. **40** and **41**). Therefore, current state analysis (analysis processing for current state) of the image processing system can be performed comparatively easily without necessarily conducting a hearing survey.

[0221] In particular, in the second embodiment, whether each of the plurality of sectional periods M1 to M4 is a stress existence period is determined by analysis for each of a plurality of users, based on the operation information on the MFP **10***a* and the biological information on a plurality of users. Accordingly, dissatisfaction of a plurality of users with respect to the MFP **10***a* can be known relatively easily.

3. Modification and Others

[0222] Although the embodiments of the present invention have been described above, the present invention is not limited to the above-described contents.

[0223] <Other Jobs>

[0224] For example, in each of the above embodiments, the "copy job" is mainly illustrated, but the present invention can also be applied to other jobs. Specifically, analysis processing and the like similar to the above may be performed for the "scan job" (see FIG. **24**) and the "box print

job" (FIG. **25**). Also, analysis processing and the like similar to the above may be performed for the "PC print job (security print job)" (FIG. **26**) and the like.

[0225] The box print job is a job for printing out a data file stored in a box (HDD) (a file in a box) of the MFP **10**. As shown in FIG. **25**, a print data search operation and the like are also performed in the period M**2** in the box print job.

[0226] Further, as described above, the security print (also referred to as authentication print) is a technique in which the user does not allow the MFP **10** or the like to print out immediately, and carries out printout after login to the MFP **10** (after authentication processing) by using the operation unit and the like of the MFP **10** on the basis of the print data transmitted from the computer. According to this, since the MFP **10** prints out after the user moves from the location of the computer to the location of the MFP **10**, it is possible to prevent another person from seeing the printouts output to the discharge tray or the like of the MFP **10** (printouts left for a while). With respect to the security print job, the time when the client **30** accesses the MFP **10** for job setting or the like may be adopted as the time T**0** (see FIG. **26**). In the security print job, the setting operation of the print job (e.g., the print setting operation) and the registration operation are also performed using the client **30** in the period M**1**.

[0227] It is also preferable to analyze the causes of stress concerning each of the periods M**1** to M**4** in consideration of the type of each job. Specifically, the analysis processing as described above is executed for each job, and the cause of the stress and the like may be analyzed together with the characteristics of the job.

[0228] For example, when the job to be analyzed is the "security print" job, the client **30** performs a print setting operation and the like in the period M**1** as shown in FIG. **26**. Therefore, when it is determined that the period M**1** of the security print job is the "stress existence period", difficulty of the setting operation (the setting operation is difficult) is also estimated as a cause of stress.

[0229] <Exceptional Processing Related to Stress Determination>

[0230] In each of the above embodiments, when a state in which a predetermined index value (e.g., a blood pressure value) relating to biological information has a value outside a predetermined reference range (also referred to as an abnormal state) has occurred, it is always determined that "apparatus-related stress state" has occurred (that the period having the abnormal state is a stress period), but the present invention is not limited thereto.

[0231] For example, even when a state in which a predetermined index value has a value outside a predetermined reference range (abnormal state) has occurred, if the abnormal state continues for a time longer than a predetermined threshold value TH**2** (e.g., 10 minutes), the continuation period of the abnormal state may be excluded from the "stress period". In other words, it may be considered that the apparatus-related stress state has not occurred during the continuation of the abnormal state. Further, on the condition that the state has occurred before the user logs in (specifically, the state has already occurred at the user's login time T**1** to the MFP **10** (more preferably, at the time T**0** earlier than that)), it is preferable to exclude the duration of the state from the "stress period".

[0232] More specifically, when the user is already feeling stress at the login time T**1** (an abnormal state has already occurred), the server **70** also acquires the biological information on the user from the time point that is earlier than the login time T**1** by a predetermined time period (e.g., 15 minutes) (and before the time T**0**) to the login time T**1**. Then, when the abnormal state continues for a period longer than a predetermined threshold value TH**2** (e.g., 10 minutes), the duration of the abnormal state may be excluded from the "stress period". In other words, it may be considered that the apparatus-related stress state has not occurred during the continuation of the abnormal state.

[0233] For example, when an abnormal state continues for 15 minutes from a time T**11** (=T**1**−10 (minutes)) that is earlier than the login time T**1** by 10 minutes to a time T**12** (=T**1**+5 (minutes)) that is later than the login time T**1** by 5 minutes, the period from the time T**11** to the time T**12** may be excluded from the "stress period". Alternatively, when an abnormal state continues for a dozen minutes or so (=5 minutes+a few minutes+5 minutes) from a time T**13** (=T**0**−5 (minutes)) that is earlier than the time T**0** by 5 minutes to a time T**14** (=T**1**+5 (minutes)) that is later than the login time T**1** by 5 minutes, the period from the time T**13** to the time T**14** may be excluded from the "stress period".

[0234] According to this, stress caused by factors other than the MFP **10** can be excluded appropriately from the examination object. For example, when the user receives mental damage due to other factors immediately before the operation of the MFP **10**, the stress based on the other factors can be appropriately eliminated from the examination object.

[0235] <Others>

[0236] In each of the above embodiments, the biological information obtained by detection by the wearable terminal **50** is directly transmitted from the wearable terminal **50** to the server **70**, but the present invention is not limited thereto. For example, the biological information may be transmitted from the wearable terminal **50** to the server **70** via the MFP **10**.

[0237] In addition, the biological information and the operation information are not limited to being sent to the server **70** in a mutually independent state, and may be transmitted to the server **70** in a state in which the biological information and the operation information are combined.

[0238] In each of the embodiments described above, the analysis processing is performed by the server **70**, but the present invention is not limited thereto and the analysis processing may be performed by the MFP **10** for example. In other words, the MFP **10** may function as an analyzing apparatus.

[0239] More specifically, the MFP **10** may acquire the biological information from each wearable terminal **50** and may also acquire the operation information on the apparatus stored in the MFP **10** (and/or the operation information on another MFP **10**). Then, the analysis processing as described above may be performed based on these pieces of information.

[0240] In each of the above embodiments, the analysis result obtained by the analysis section **85** is displayed on the display section **76***b* of the server **70**, but the present invention is not limited to this. For example, the analysis result may be output as a voice by the voice input/output control section **84** or the like of the server **70**, or may be output to another apparatus (e.g., the client **30** or the MFP **10**) through communication by the communication unit **74** or the like of

the server **70**. Further, the analysis result may be printed out using the MFP **10** or the like on the basis of an instruction from the server **70**.

[0241] While the invention has been shown and described in detail, the foregoing description is in all aspects illustrative and not restrictive. It is therefore understood that numerous modifications and variations can be devised without departing from the scope of the invention.

What is claimed is:

1. An image processing system comprising:

an acquiring section that acquires biological information on a user who makes an image processing apparatus execute a job and operation information on the image processing apparatus, the biological information changing depending on a state of the user;

an analysis section that analyzes stress of the user concerning use of the image processing apparatus, based on the biological information and the operation information; and

an output section that outputs an analysis result obtained by the analysis section.

2. The image processing system according to claim **1**, wherein

the biological information is information that changes depending on a mental state and/or physical condition of the user.

3. The image processing system according to claim **1**, wherein

the biological information includes information on at least one of a pulse wave, an electrocardiogram, a body temperature, a heart rate, and a blood pressure.

4. The image processing system according to claim **1**, wherein

the analysis section determines that an apparatus-related stress state in which the user feels stress related to the image processing apparatus occurs, on condition that a predetermined index value related to the biological information has a value outside a predetermined reference range.

5. The image processing system according to claim **4**, wherein

even when an abnormal state in which the predetermined index value has a value outside the predetermined reference range has occurred, the analysis section considers that the apparatus-related stress state has not occurred during continuation of the abnormal state if the abnormal state occurs before the user logs in to the image processing apparatus and continues for a time longer than a predetermined threshold value.

6. The image processing system according to claim **4**, wherein

the analysis section divides an operation period in the image processing apparatus into a plurality of sectional periods according to a progress step of an operation, and determines that a sectional period during which the apparatus-related stress state occurs among the plurality of sectional periods is a stress existence period that is a period during which user stress related to the image processing apparatus exists.

7. The image processing system according to claim **6**, wherein

the plurality of sectional periods are defined by dividing the operation period using a plurality of time points including at least one of login time, job start time, job end time, and logout time.

8. The image processing system according to claim **6**, wherein

the acquiring section acquires biological information on a plurality of users, and

the analysis section analyzes to determine whether each of the plurality of sectional periods is the stress existence period for each of the plurality of users, based on the biological information on the plurality of users and the operation information on the image processing apparatus.

9. The image processing system according to claim **6**, wherein

the acquiring section acquires operation information on a plurality of image processing apparatuses, and

the analysis section analyzes to determine whether each of the plurality of sectional periods is the stress existence period for each of the plurality of image processing apparatuses, based on the biological information and the operation information on the plurality of image processing apparatuses.

10. The image processing system according to claim **9**, wherein

when the stress existence period exists with respect to a first image processing apparatus among the plurality of image processing apparatuses, the analysis section identifies a second image processing apparatus different from the first image processing apparatus out of the plurality of image processing apparatuses, the second image processing apparatus having a cumulative number of stress occurrences of the user in a sectional period corresponding to the stress existence period, the cumulative number of the second image processing apparatus being fewer than a cumulative number of the first image processing apparatus, and the analysis section proposes an improvement measure concerning the stress existence period of the first image processing apparatus, based on information on the second image processing apparatus.

11. The image processing system according to claim **10**, wherein

when the sectional period corresponding to the stress existence period is a period between a start time of each job and an end time of the each job, the analysis section proposes that the first image processing apparatus should be changed to an apparatus having a processing speed equal to or higher than the processing speed of the second image processing apparatus as the improvement measure concerning the stress existence period of the first image processing apparatus.

12. The image processing system according to claim **10**, wherein

when the sectional period corresponding to the stress existence period is a period between each login time by the user and time earlier than the each login time by a predetermined time period, the analysis section proposes that an installation location of the first image processing apparatus should be changed with reference to an installation location of the second image process-

ing apparatus as the improvement measure concerning the stress existence period of the first image processing apparatus.

13. The image processing system according to claim **1**, wherein

the acquiring section acquires biological information on a plurality of users, and

the analysis section analyzes stress of the plurality of users concerning use of the image processing apparatus, based on the biological information on the plurality of users and the operation information on the image processing apparatus.

14. The image processing system according to claim **1**, wherein

the acquiring section acquires operation information on a plurality of image processing apparatuses, and

the analysis section analyzes stress of the user concerning use of each of the plurality of image processing apparatuses, based on the biological information on the user and the operation information on the plurality of image processing apparatuses.

15. The image processing system according to **14**, wherein

the analysis section manages the plurality of image processing apparatuses as one apparatus group, and

when it is determined that stress of the user related to one image processing apparatus out of the one apparatus group exists, the analysis section proposes an improvement measure to relieve stress of the user, based on information on another image processing apparatus different from the one image processing apparatus in the one apparatus group.

16. The image processing system according to claim **1**, wherein

the output section displays the analysis result using a display screen including a table or a graph.

17. The image processing system according to claim **1**, wherein

the output section displays the analysis result using a layout drawing showing a positional relationship between an installation location of the image processing apparatus and a seat position of the user.

18. The image processing system according to claim **1**, further comprising:

the image processing apparatus;

a wearable device worn by the user; and

a server provided separately from the image processing apparatus,

the server including:

the acquiring section; and

the analysis section,

wherein the acquiring section acquires biological information obtained by measurement by the wearable device from the wearable device and acquires the operation information from the image processing apparatus.

19. The image processing system according to claim **1**, further comprising:

the image processing apparatus; and

a wearable device worn by the user,

the image processing apparatus including:

the acquiring section; and

the analysis section,

wherein the acquiring section acquires biological information obtained by measurement by the wearable device from the wearable device and acquires the operation information from the image processing apparatus itself.

20. The image processing system according to claim **18**, wherein the acquiring section acquires the biological information obtained by measurement by the wearable device from the wearable device by periodic communication.

21. An analyzing apparatus comprising:

an acquiring section that acquires biological information on a user who makes an image processing apparatus execute a job and operation information on the image processing apparatus, the biological information changing depending on a state of the user;

an analysis section that analyzes stress of the user concerning use of the image processing apparatus, based on the biological information and the operation information; and

an output section that outputs an analysis result obtained by the analysis section.

22. A non-transitory computer-readable recording medium for recording a program that causes a computer to execute a process comprising the steps of:

a) acquiring biological information on a user who makes an image processing apparatus execute a job and operation information on the image processing apparatus, the biological information changing depending on a state of the user;

b) analyzing stress of the user concerning use of the image processing apparatus, based on the biological information and the operation information; and

c) outputting an analysis result of the step b).

23. The non-transitory computer-readable recording medium according to claim **22**, wherein

operation information on a plurality of image processing apparatuses is acquired in the step a),

the step b) including:

b-1) analyzing the stress of the user concerning use of each of the plurality of image processing apparatuses, based on the biological information on the user and the operation information on the plurality of image processing apparatuses,

in the step b-1), an operation period in each of the plurality of image processing apparatuses is divided into a plurality of sectional periods according to a progress step of an operation, and

a sectional period during which an apparatus-related stress state in which the user feels stress related to each of the plurality of image processing apparatuses occurs, among the plurality of sectional periods is determined to be a stress existence period that is a period during which user stress related to each of the plurality of image processing apparatuses exists,

the step b) further including:

b-2) proposing an improvement measure concerning the stress existence period of a first image processing apparatus based on information on a second image processing apparatus when the stress existence period exists with respect to the first image processing apparatus among the plurality of image processing apparatuses, by identifying the second image processing apparatus different from the first image processing apparatus

out of the plurality of image processing apparatuses, the second image processing apparatus having a cumulative number of stress occurrences of the user in a sectional period corresponding to the stress existence period, the cumulative number of the second image processing apparatus being fewer than a cumulative number of the first image processing apparatus.

24. The non-transitory computer-readable recording medium according to claim **22**, wherein

in the step a), operation information on a plurality of image processing apparatuses is acquired, and

the plurality of image processing apparatuses are managed as one apparatus group, and

in the step b), when stress of the user related to one image processing apparatus of the one apparatus group is determined to exist, an improvement measure for relieving the stress of the user is proposed based on information on another image processing apparatus different from the one image processing apparatus in the one apparatus group.

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摘要(译)

图像处理系统包括获取部分，其获取关于使图像处理设备执行作业的用户的生物信息和关于图像处理设备的操作信息，其中生物信息根据用户的状态而改变，分析部分分析基于生物信息和操作信息，用户对使用图像处理设备的压力，以及输出由分析部分获得的分析结果的输出部分。