FIG. 1

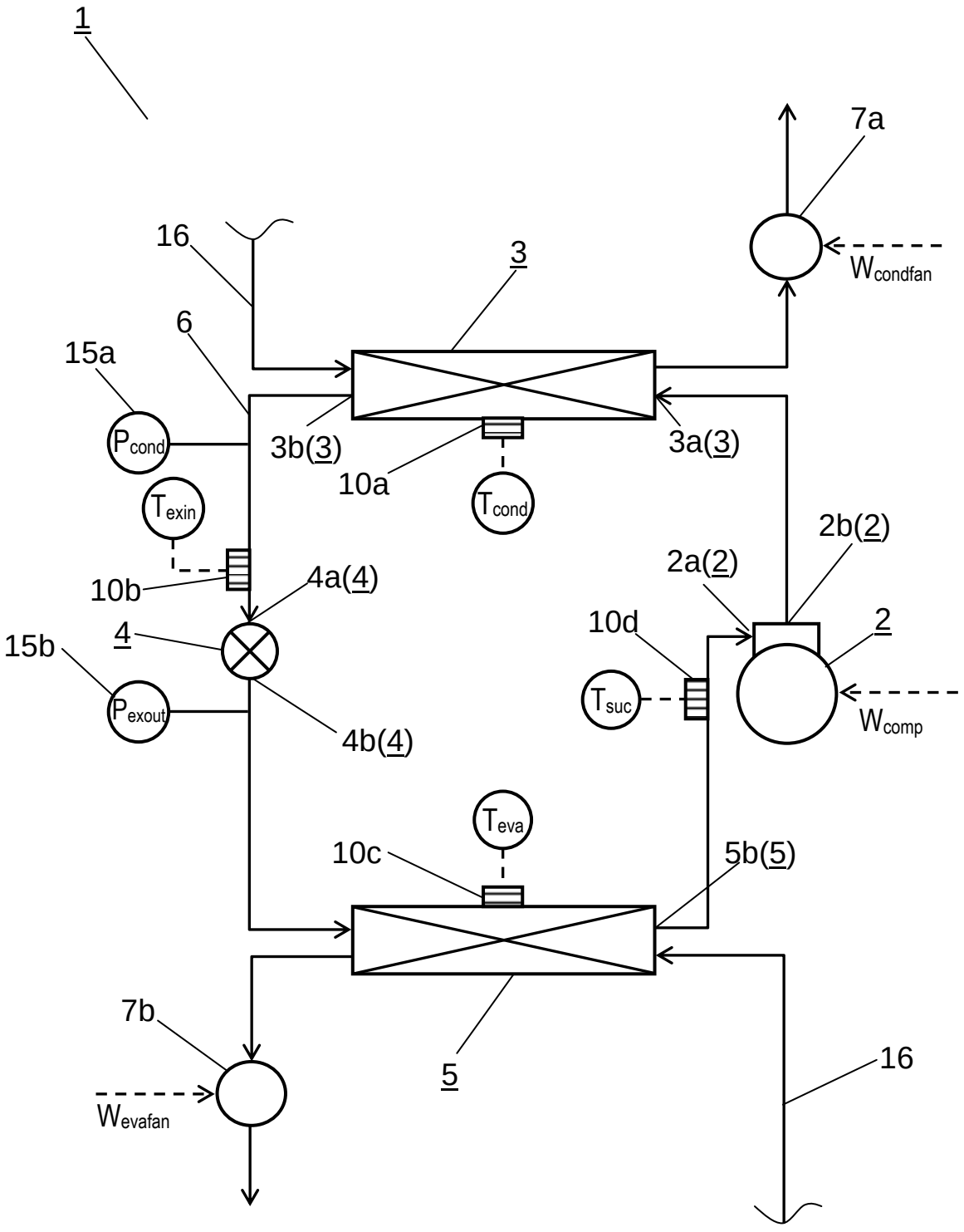

1
7a
16
3
$W_{condfan}$
6
15a
P_{cond}
3b(3)
3a(3)
10a
T_{cond}
T_{exin}
2b(2)
2a(2)
10b
4a(4)
10d
2
4
15b
T_{suc}
P_{exout}
W_{comp}
4b(4)
T_{eva}
10c
5b(5)
7b
5
16
W_{evafan}

FIG. 2

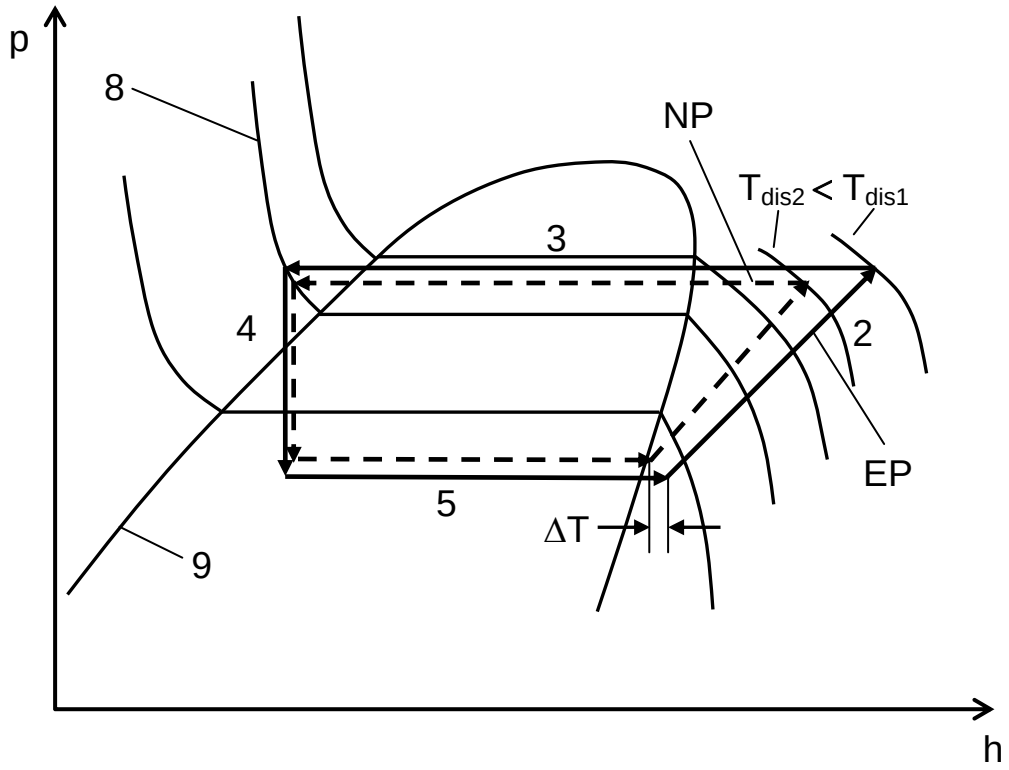

p
8
NP
$T_{dis2} < T_{dis1}$
3
4
2
EP
5
ΔT
9
h

FIG. 3

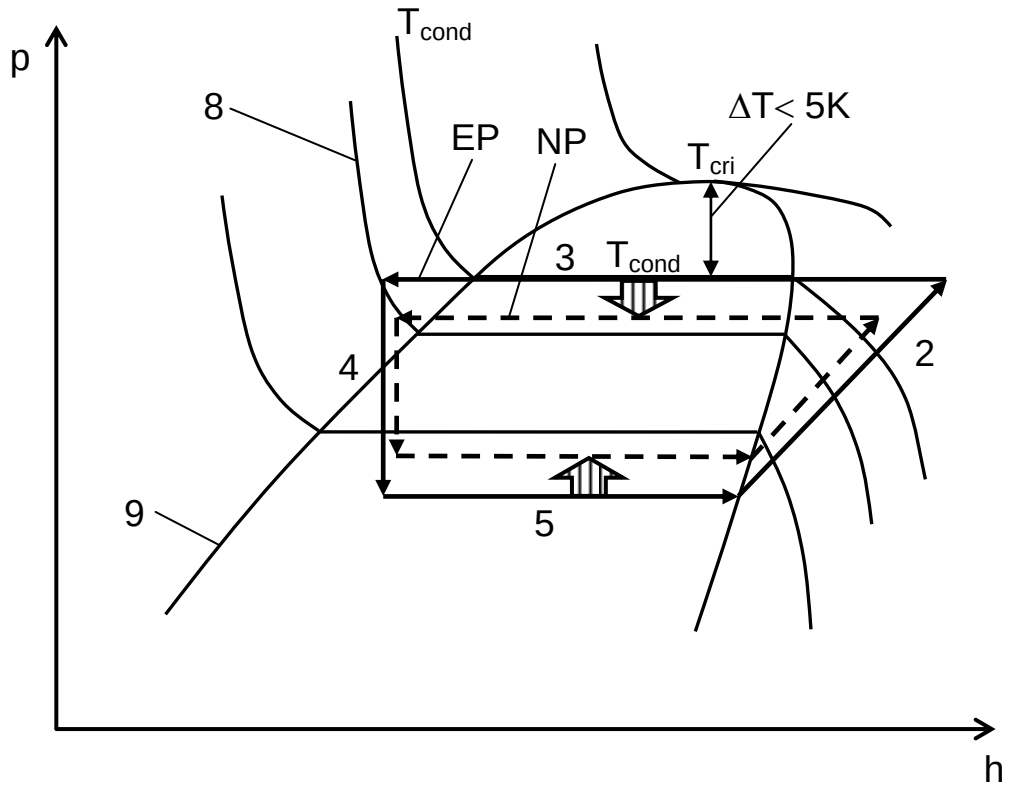

p
T_{cond}
8
EP
NP
ΔT< 5K
T_{cri}
3
T_{cond}
4
2
9
5
h

FIG. 4

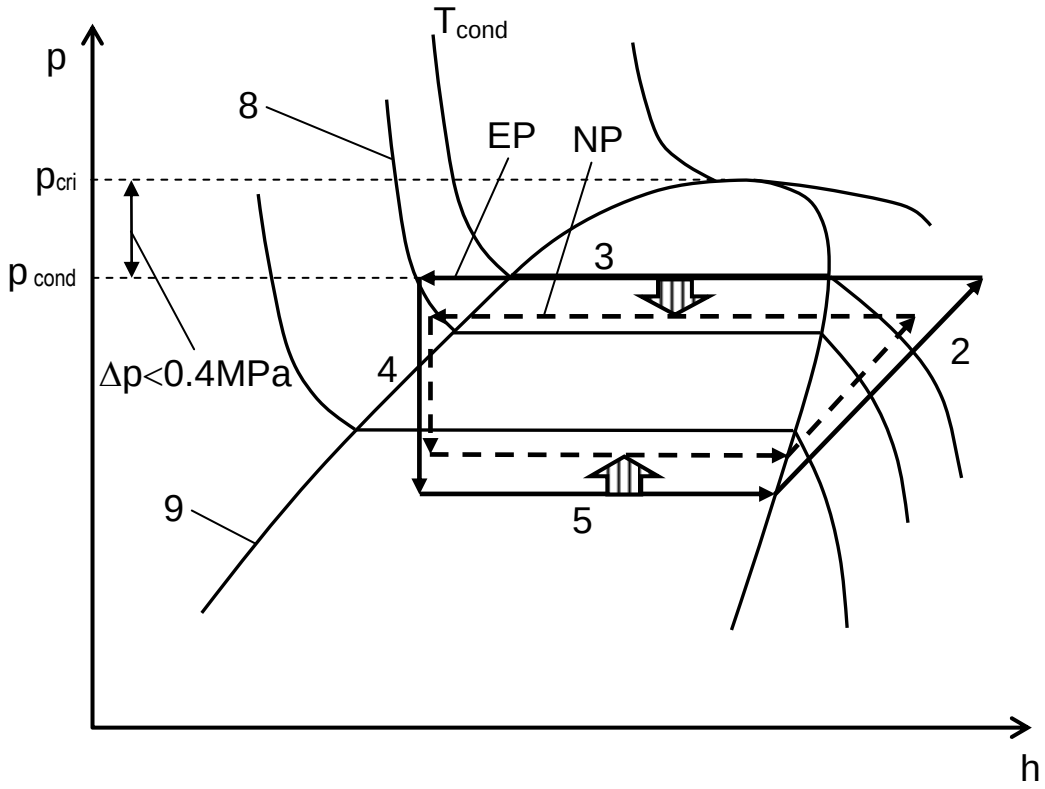

p
h
T_{cond}
8
EP
NP
p_{cri}
p_{cond}
3
2
4
$\Delta p<0.4MPa$
9
5

FIG. 5

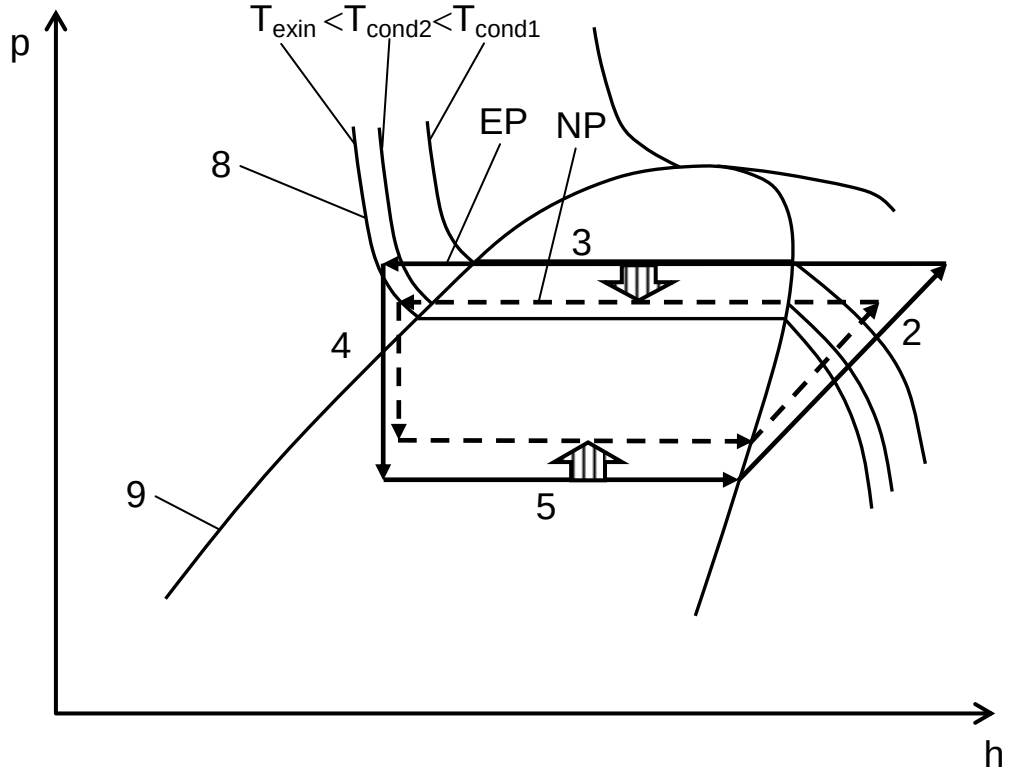

p
h
$T_{exin}<T_{cond2}<T_{cond1}$
EP
NP
8
3
2
4
9
5

FIG. 6

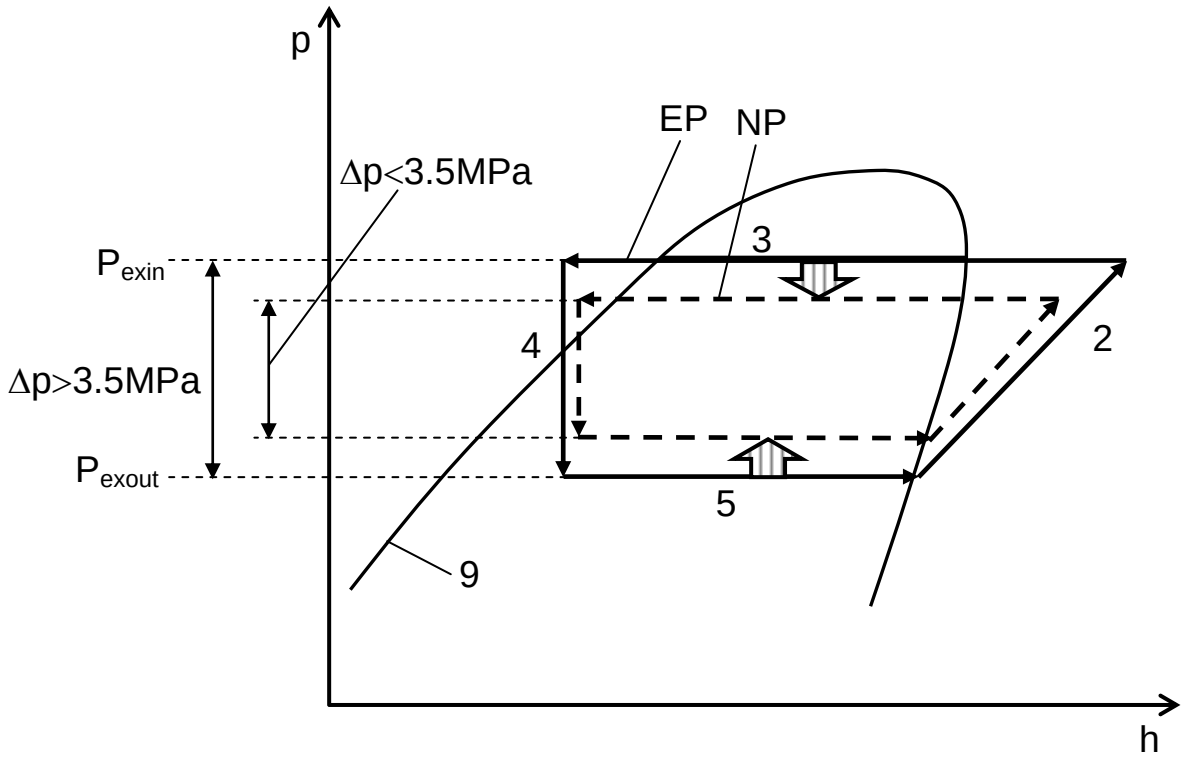

p
EP
NP
Δp<3.5MPa
3
Pexin
4
2
Δp>3.5MPa
Pexout
5
9
h

FIG. 7

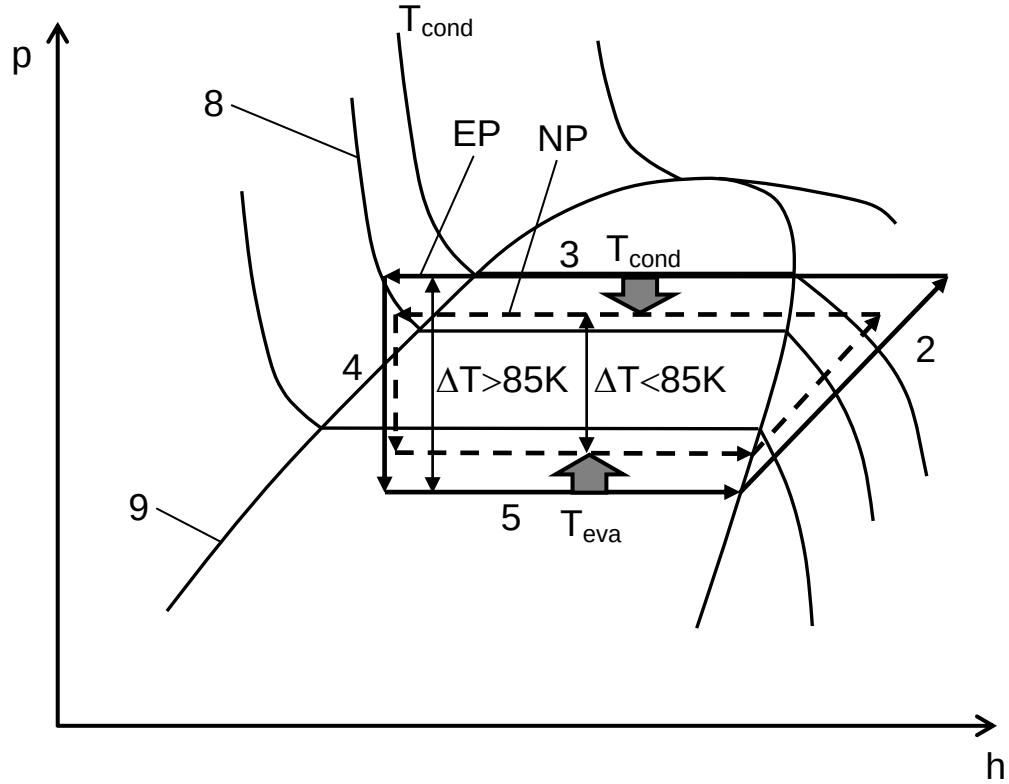

p
Tcond
8
EP
NP
3
Tcond
4
ΔT>85K
ΔT<85K
2
9
5
Teva
h

FIG. 8

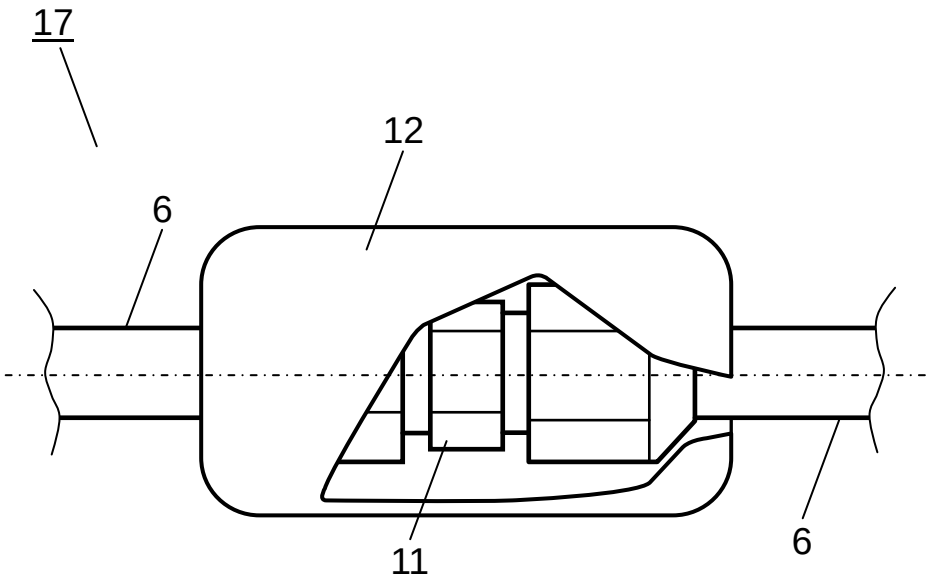


FIG. 9

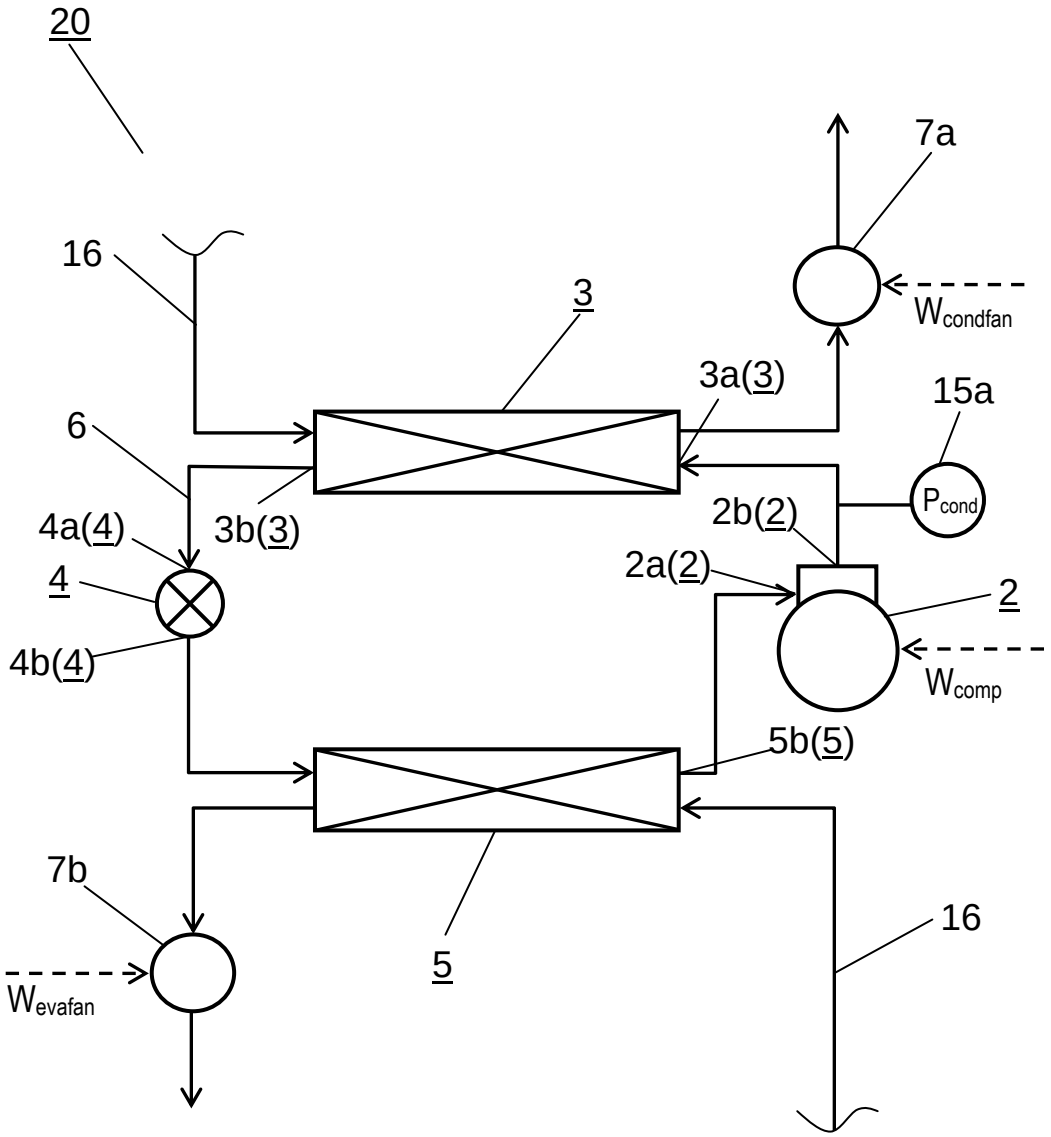

20
7a
16
3
$W_{condfan}$
3a(3)
15a
6
P_{cond}
3b(3)
2b(2)
4a(4)
2a(2)
4
2
4b(4)
W_{comp}
5b(5)
7b
16
5
W_{evafan}

FIG. 10

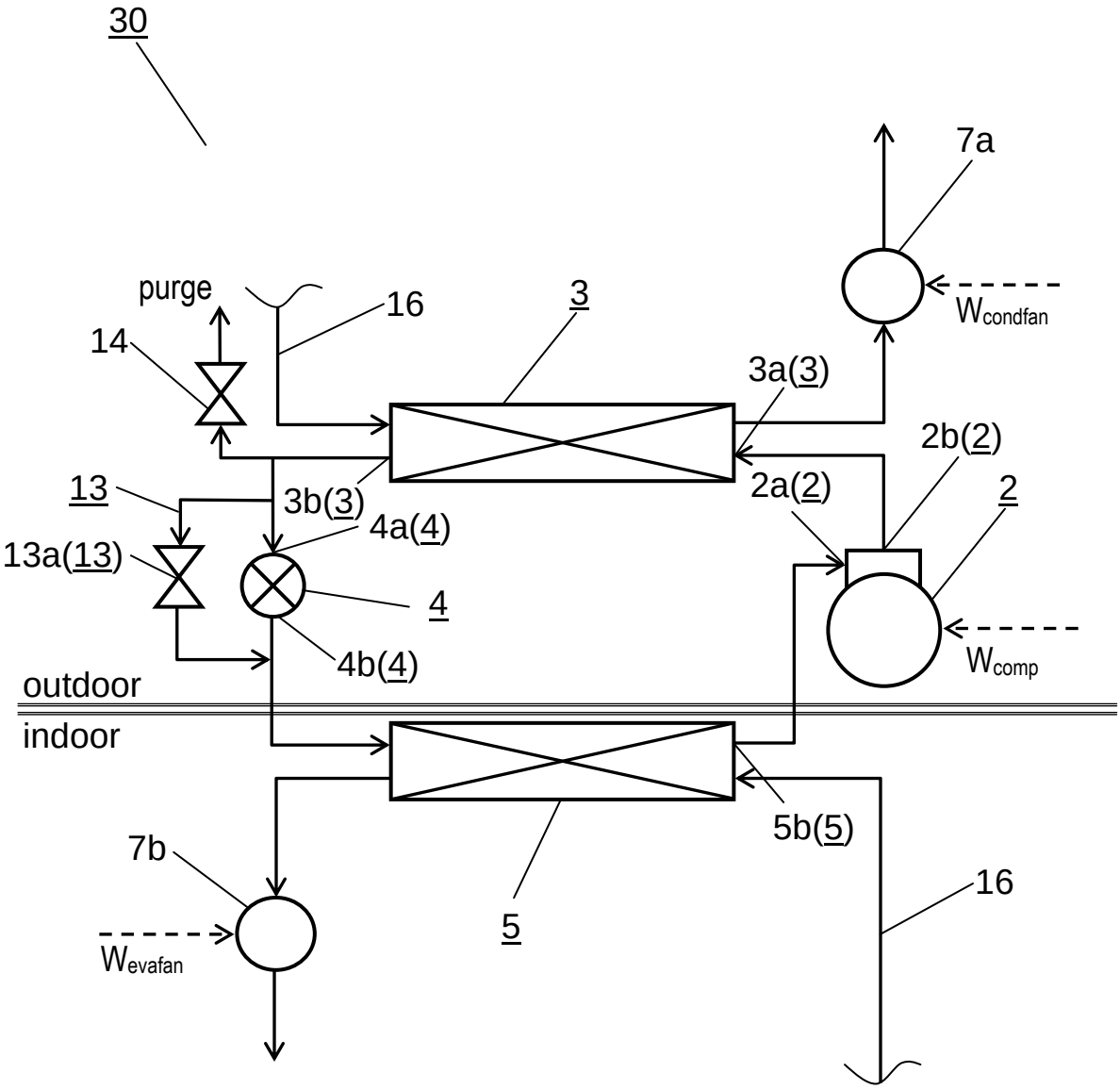

30
7a
purge
16
3
14
3a(3)
$W_{condfan}$
2b(2)
13
3b(3)
2a(2)
2
4a(4)
13a(13)
4
W_{comp}
4b(4)
outdoor
indoor
5b(5)
7b
16
5
W_{evafan}

FIG. 11

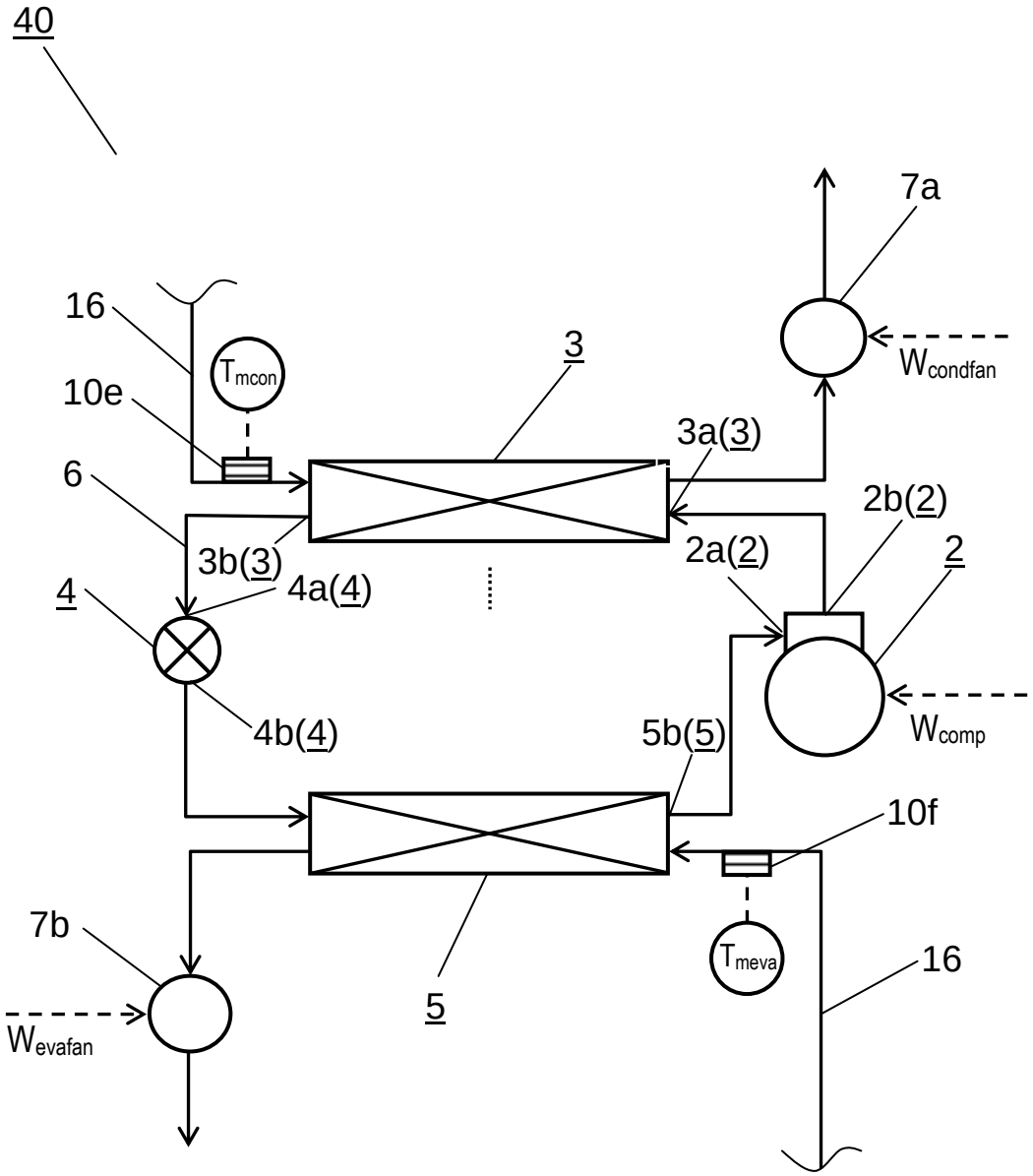

40
7a
16
T_{mcon}
3
$W_{condfan}$
10e
3a(3)
6
2b(2)
3b(3)
2a(2)
2
4
4a(4)
4b(4)
5b(5)
W_{comp}
10f
7b
T_{meva}
16
5
W_{evafan}

FIG. 12

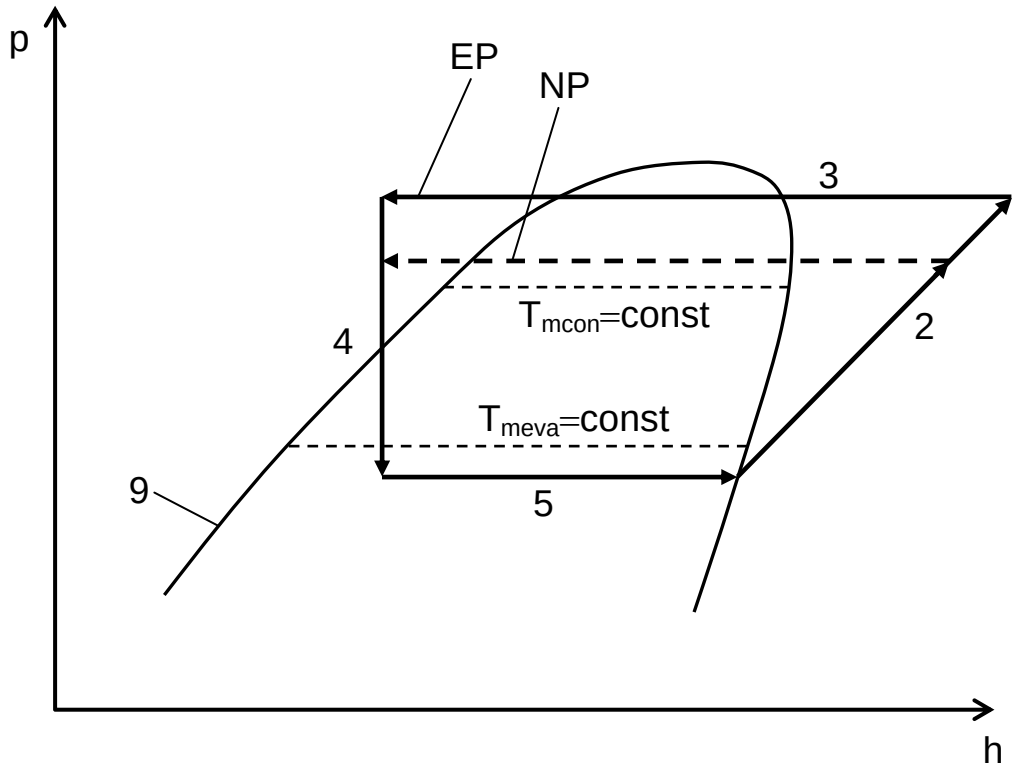


FIG. 13

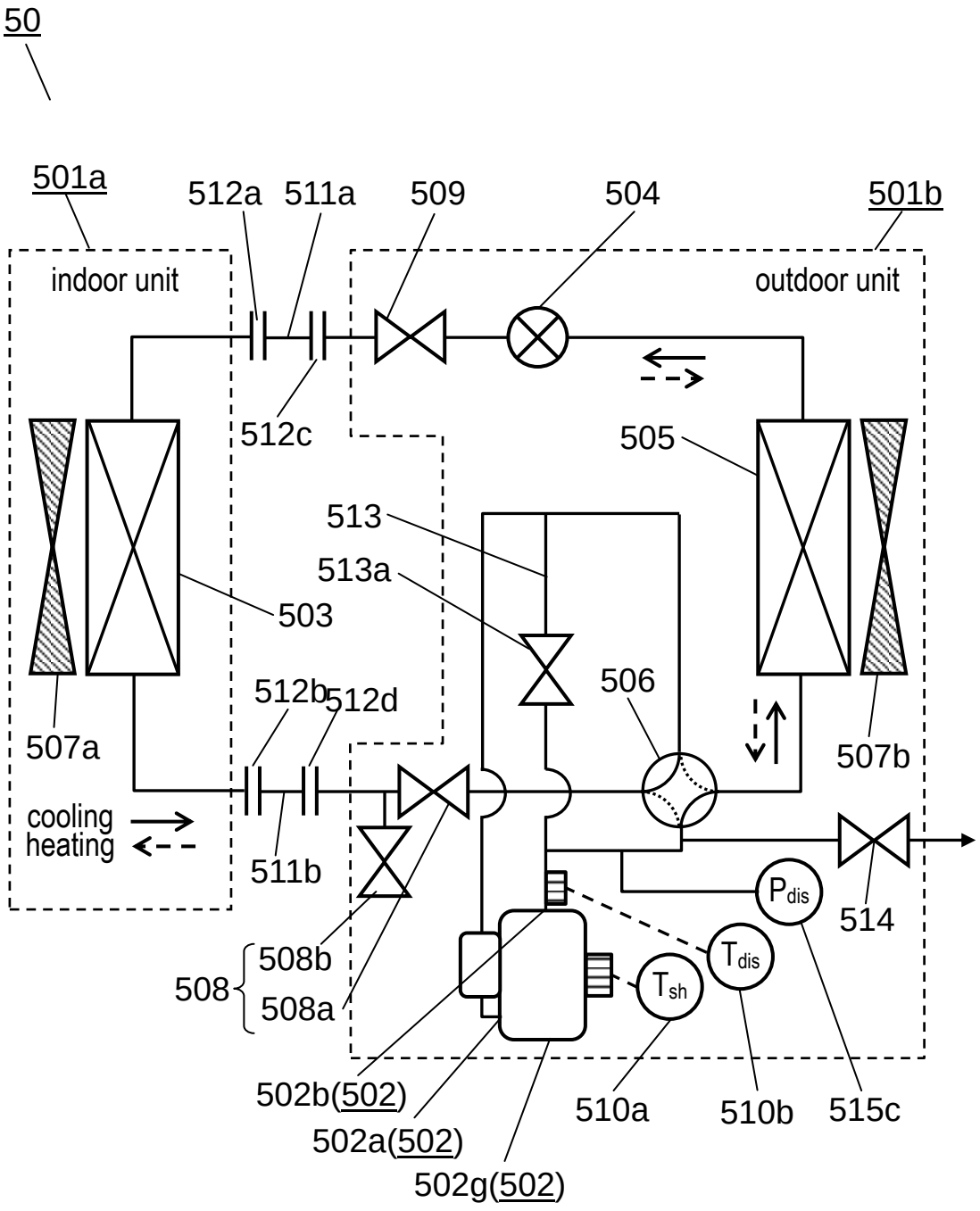

50
501a
512a
511a
509
504
501b
indoor unit
outdoor unit
512c
505
513
513a
503
506
512b
512d
507a
507b
cooling
heating
511b
514
P_{dis}
T_{dis}
T_{sh}
508
508b
508a
502b(502)
502a(502)
502g(502)
510a
510b
515c

FIG. 14

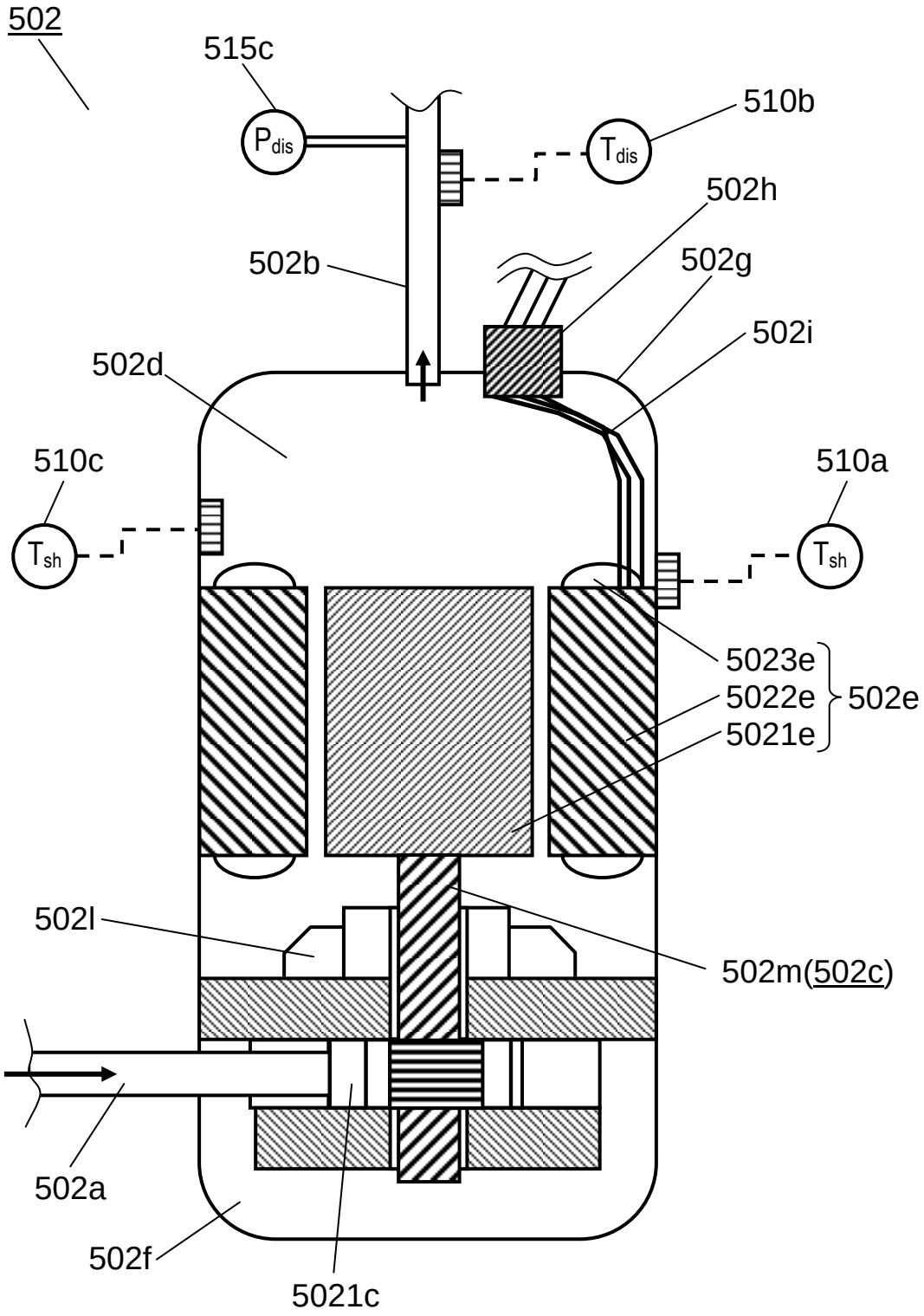

502
515c
P_{dis}
T_{dis}
510b
502h
502b
502g
502i
502d
510c
510a
T_{sh}
T_{sh}
5023e
5022e
5021e
502e
502l
502m(502c)
502a
502f
5021c

FIG. 15

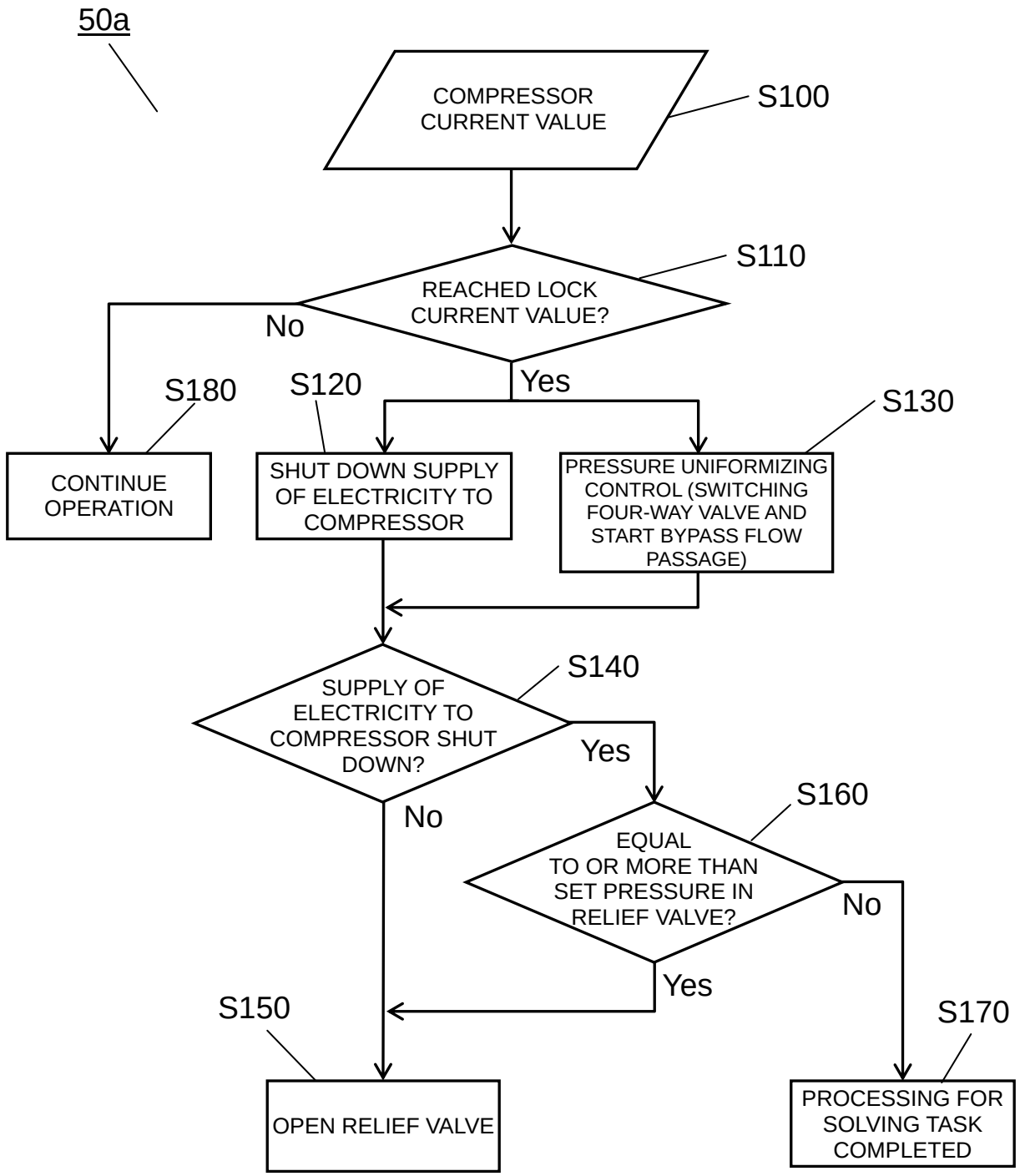

50a
COMPRESSOR CURRENT VALUE
S100
REACHED LOCK CURRENT VALUE?
S110
No
Yes
S180
S120
S130
CONTINUE OPERATION
SHUT DOWN SUPPLY OF ELECTRICITY TO COMPRESSOR
PRESSURE UNIFORMIZING CONTROL (SWITCHING FOUR-WAY VALVE AND START BYPASS FLOW PASSAGE)
SUPPLY OF ELECTRICITY TO COMPRESSOR SHUT DOWN?
S140
Yes
No
S160
EQUAL TO OR MORE THAN SET PRESSURE IN RELIEF VALVE?
No
Yes
S150
S170
OPEN RELIEF VALVE
PROCESSING FOR SOLVING TASK COMPLETED

FIG. 16

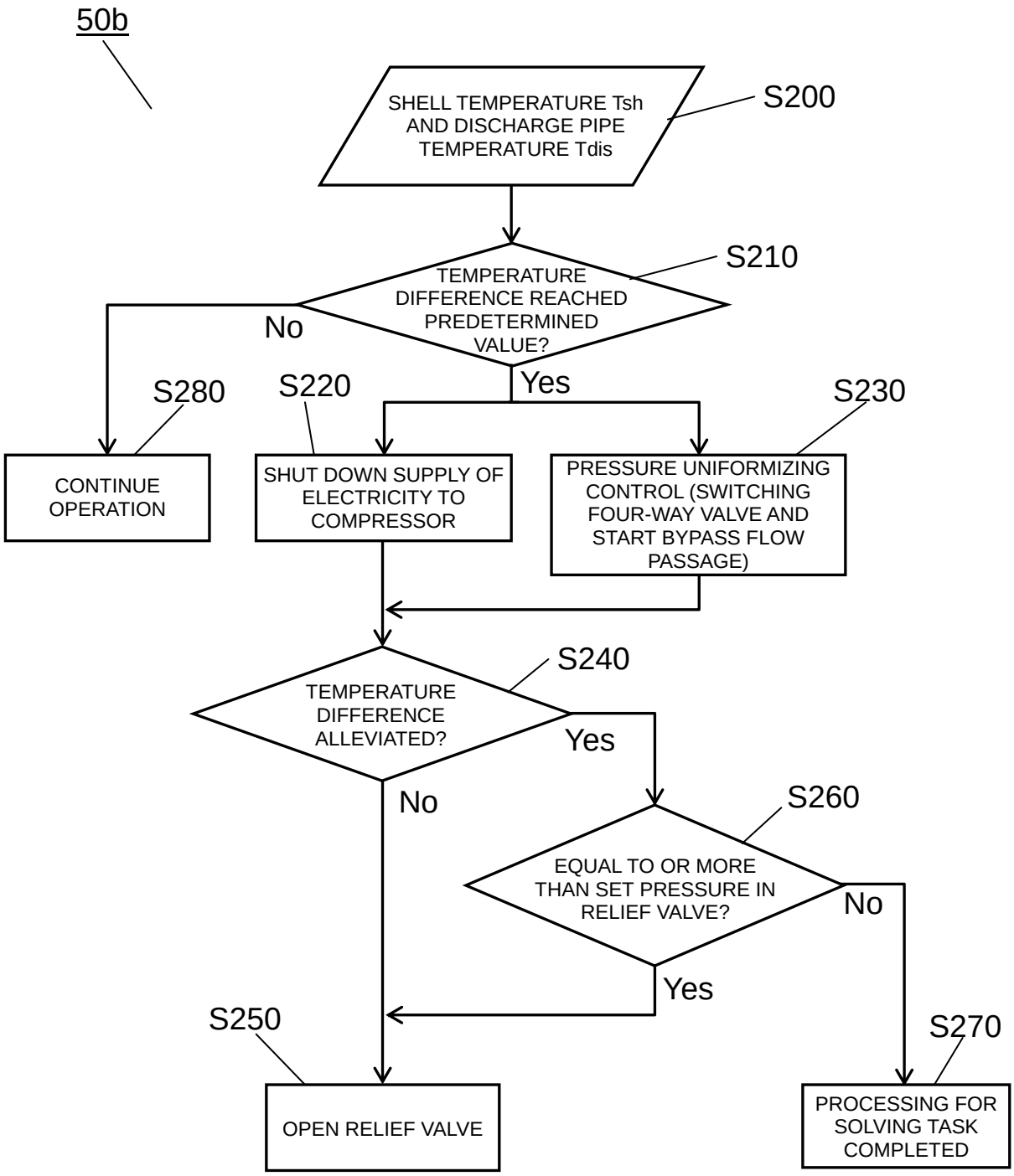

50b
SHELL TEMPERATURE Tsh AND DISCHARGE PIPE TEMPERATURE Tdis
S200
TEMPERATURE DIFFERENCE REACHED PREDETERMINED VALUE?
S210
No
Yes
S280
CONTINUE OPERATION
S220
SHUT DOWN SUPPLY OF ELECTRICITY TO COMPRESSOR
S230
PRESSURE UNIFORMIZING CONTROL (SWITCHING FOUR-WAY VALVE AND START BYPASS FLOW PASSAGE)
TEMPERATURE DIFFERENCE ALLEVIATED?
S240
Yes
No
EQUAL TO OR MORE THAN SET PRESSURE IN RELIEF VALVE?
S260
No
Yes
S250
OPEN RELIEF VALVE
S270
PROCESSING FOR SOLVING TASK COMPLETED

FIG. 17

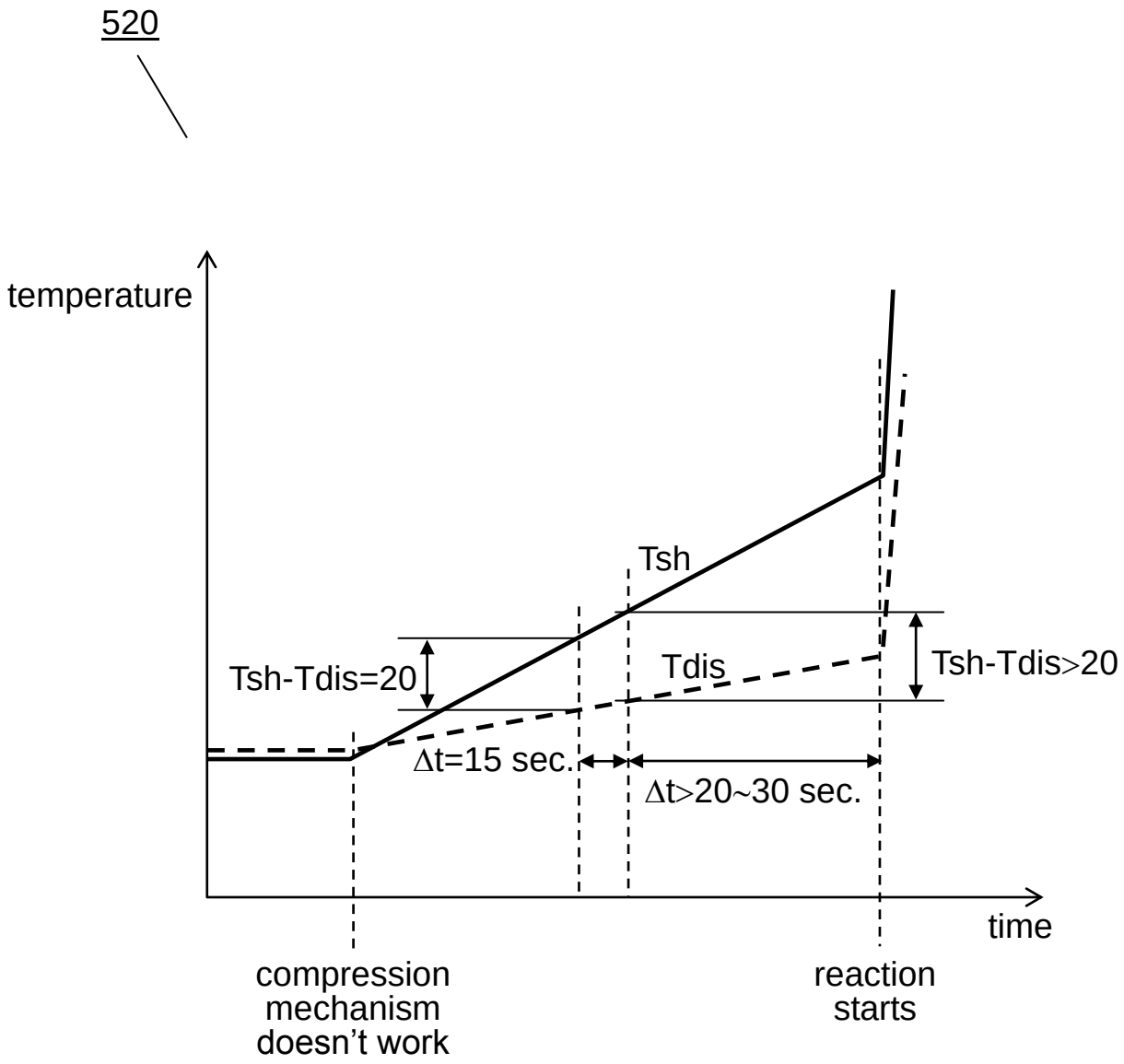

520
temperature
Tsh
Tsh-Tdis=20
Tdis
Tsh-Tdis>20
Δt=15 sec.
Δt>20~30 sec.
time
compression mechanism doesn't work
reaction starts

FIG. 18

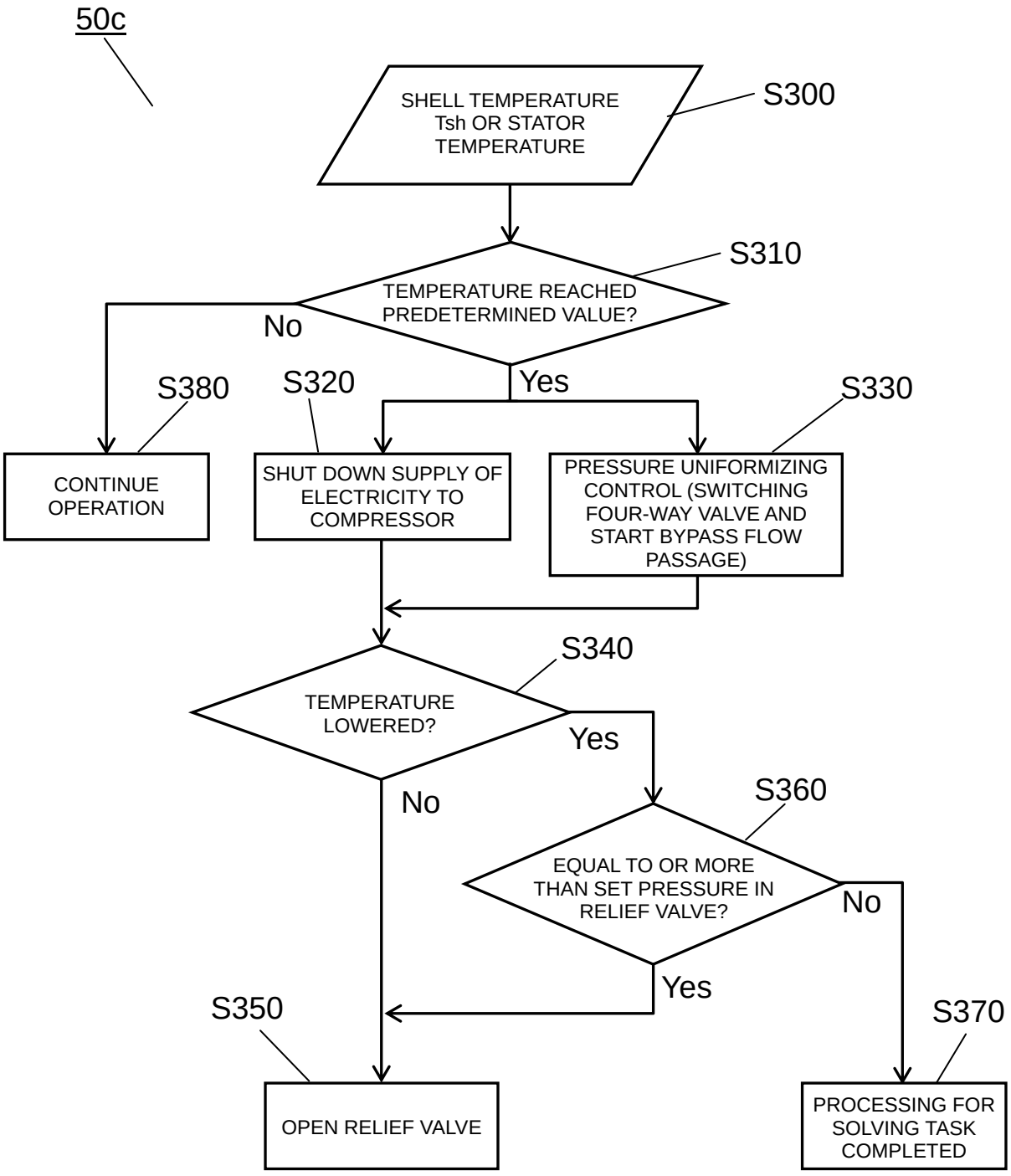
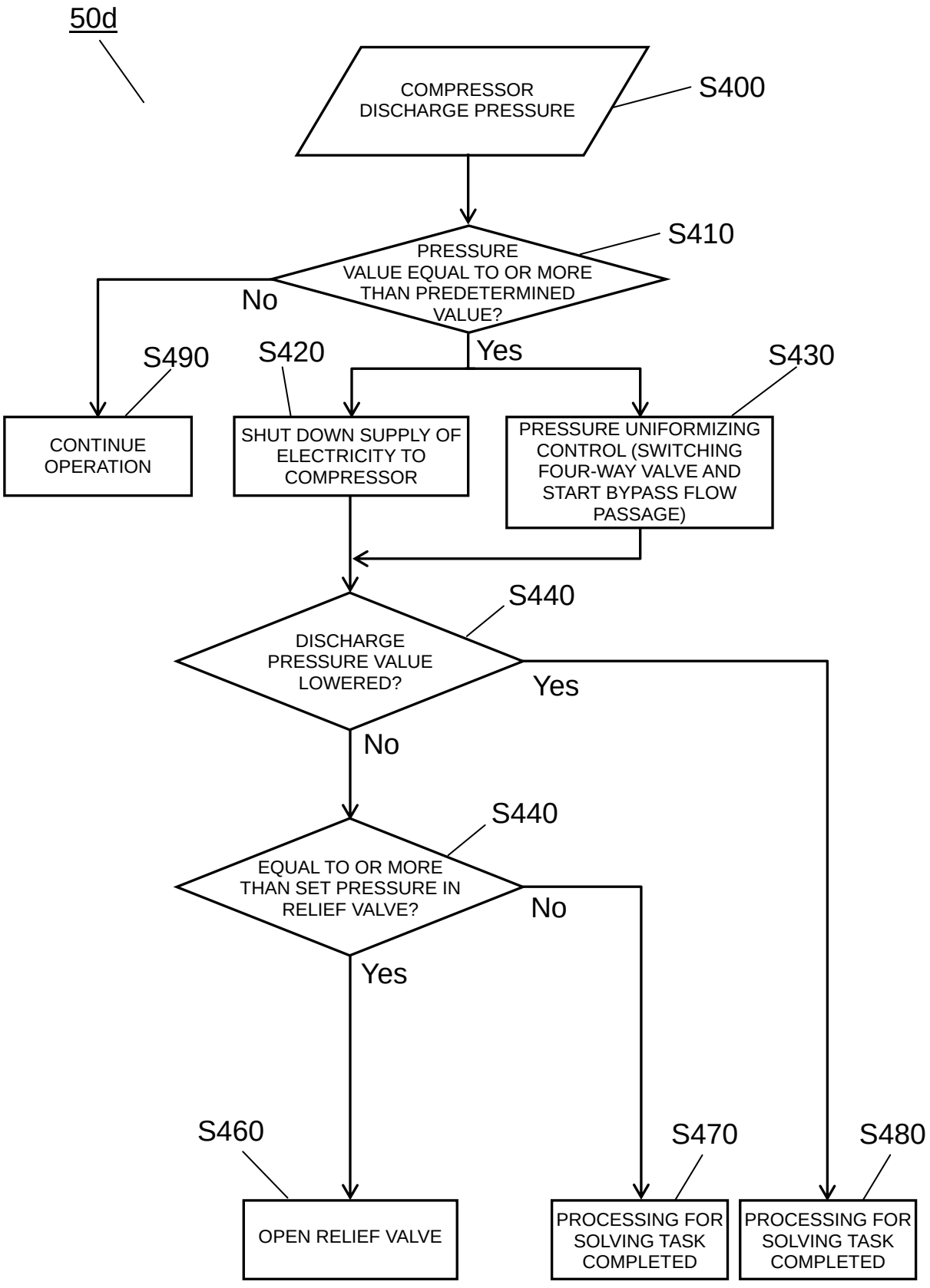

50c
SHELL TEMPERATURE Tsh OR STATOR TEMPERATURE
S300
TEMPERATURE REACHED PREDETERMINED VALUE?
S310
No
Yes
S380
CONTINUE OPERATION
S320
SHUT DOWN SUPPLY OF ELECTRICITY TO COMPRESSOR
S330
PRESSURE UNIFORMIZING CONTROL (SWITCHING FOUR-WAY VALVE AND START BYPASS FLOW PASSAGE)
TEMPERATURE LOWERED?
S340
Yes
No
EQUAL TO OR MORE THAN SET PRESSURE IN RELIEF VALVE?
S360
No
Yes
S350
OPEN RELIEF VALVE
S370
PROCESSING FOR SOLVING TASK COMPLETED

FIG. 19


50d
COMPRESSOR DISCHARGE PRESSURE
S400
PRESSURE VALUE EQUAL TO OR MORE THAN PREDETERMINED VALUE?
S410
No
Yes
S490
CONTINUE OPERATION
S420
SHUT DOWN SUPPLY OF ELECTRICITY TO COMPRESSOR
S430
PRESSURE UNIFORMIZING CONTROL (SWITCHING FOUR-WAY VALVE AND START BYPASS FLOW PASSAGE)
DISCHARGE PRESSURE VALUE LOWERED?
S440
Yes
No
EQUAL TO OR MORE THAN SET PRESSURE IN RELIEF VALVE?
S440
No
Yes
S460
OPEN RELIEF VALVE
S470
PROCESSING FOR SOLVING TASK COMPLETED
S480
PROCESSING FOR SOLVING TASK COMPLETED