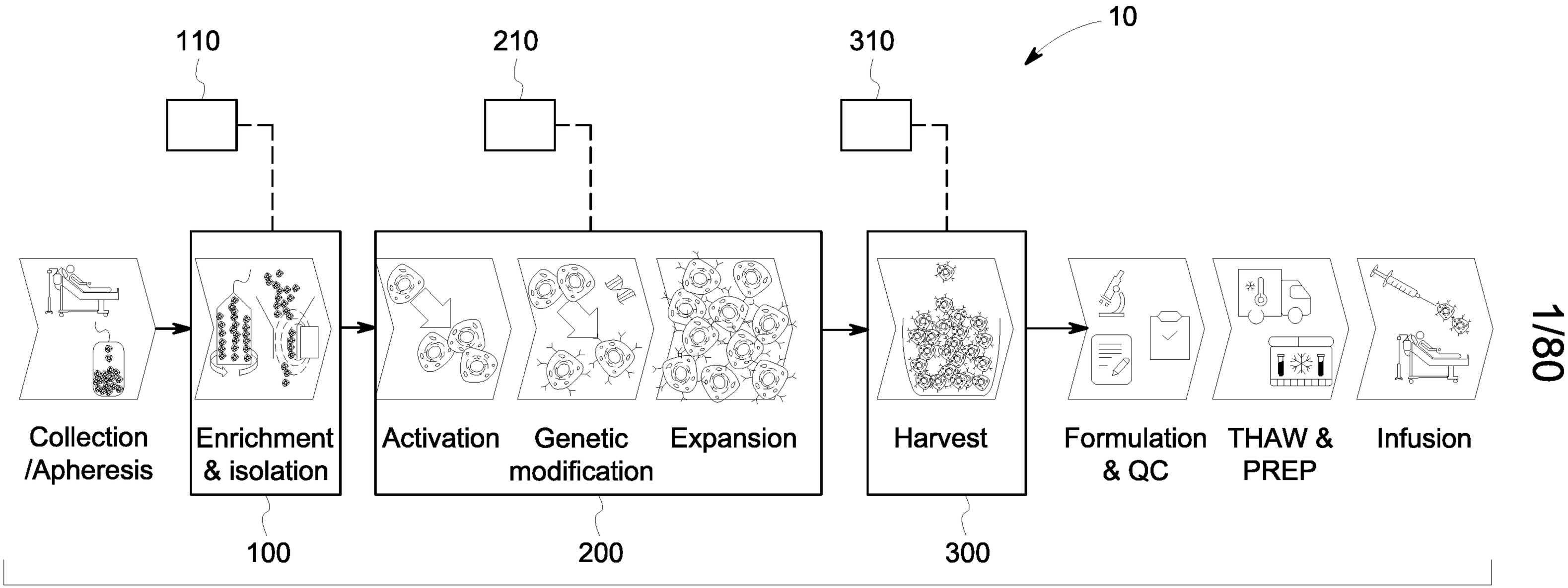

10
110
210
310
Collection /Apheresis
Enrichment & isolation
Activation
Genetic modification
Expansion
Harvest
Formulation & QC
THAW & PREP
Infusion
100
200
300

FIG. 1

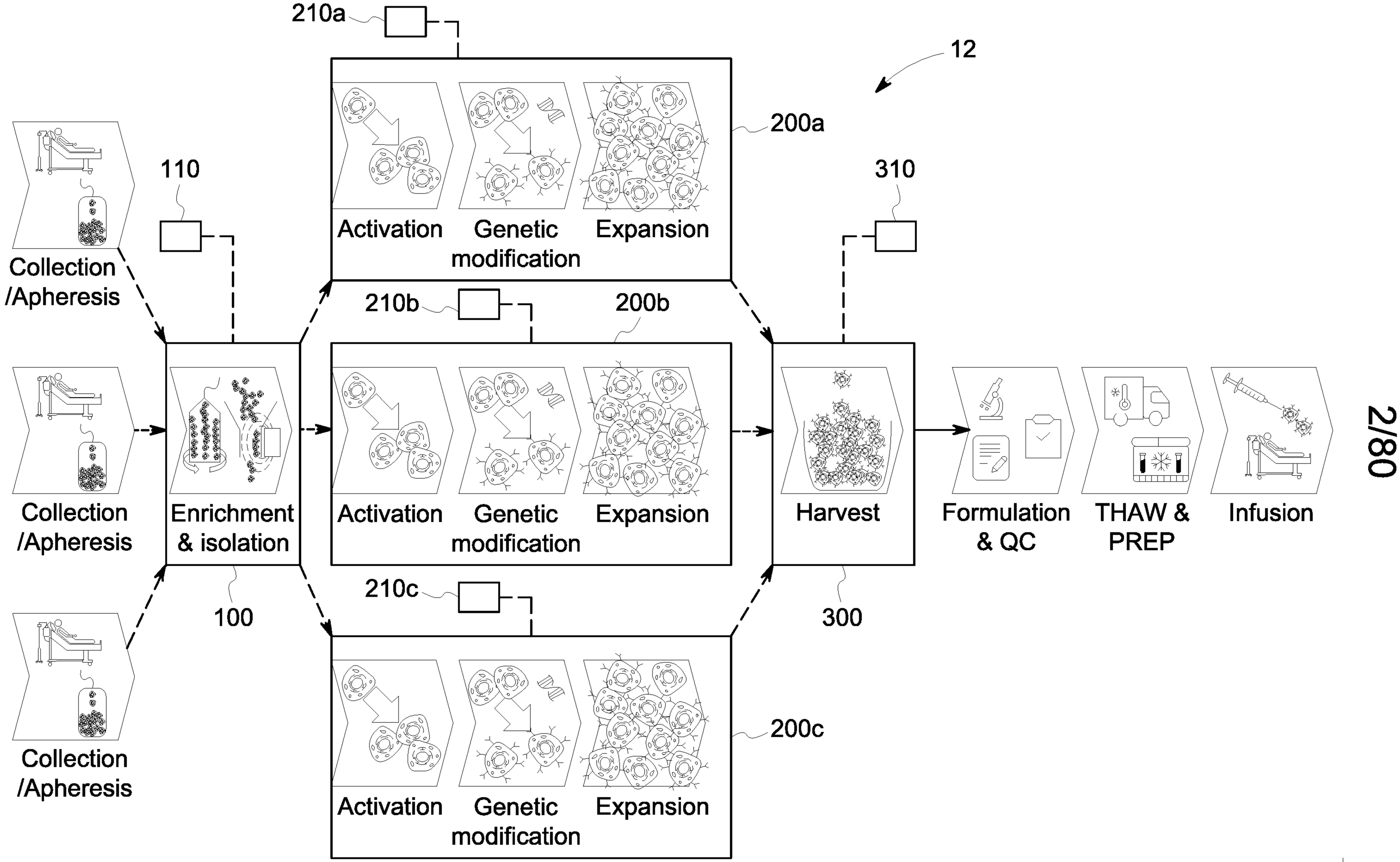

210a
12
200a
110
310
Collection
/Apheresis
Activation
Genetic
modification
Expansion
210b
200b
Collection
/Apheresis
Enrichment
& isolation
Activation
Genetic
modification
Expansion
Harvest
Formulation
& QC
THAW &
PREP
Infusion
100
210c
300
Collection
/Apheresis
200c
Activation
Genetic
modification
Expansion

FIG. 2

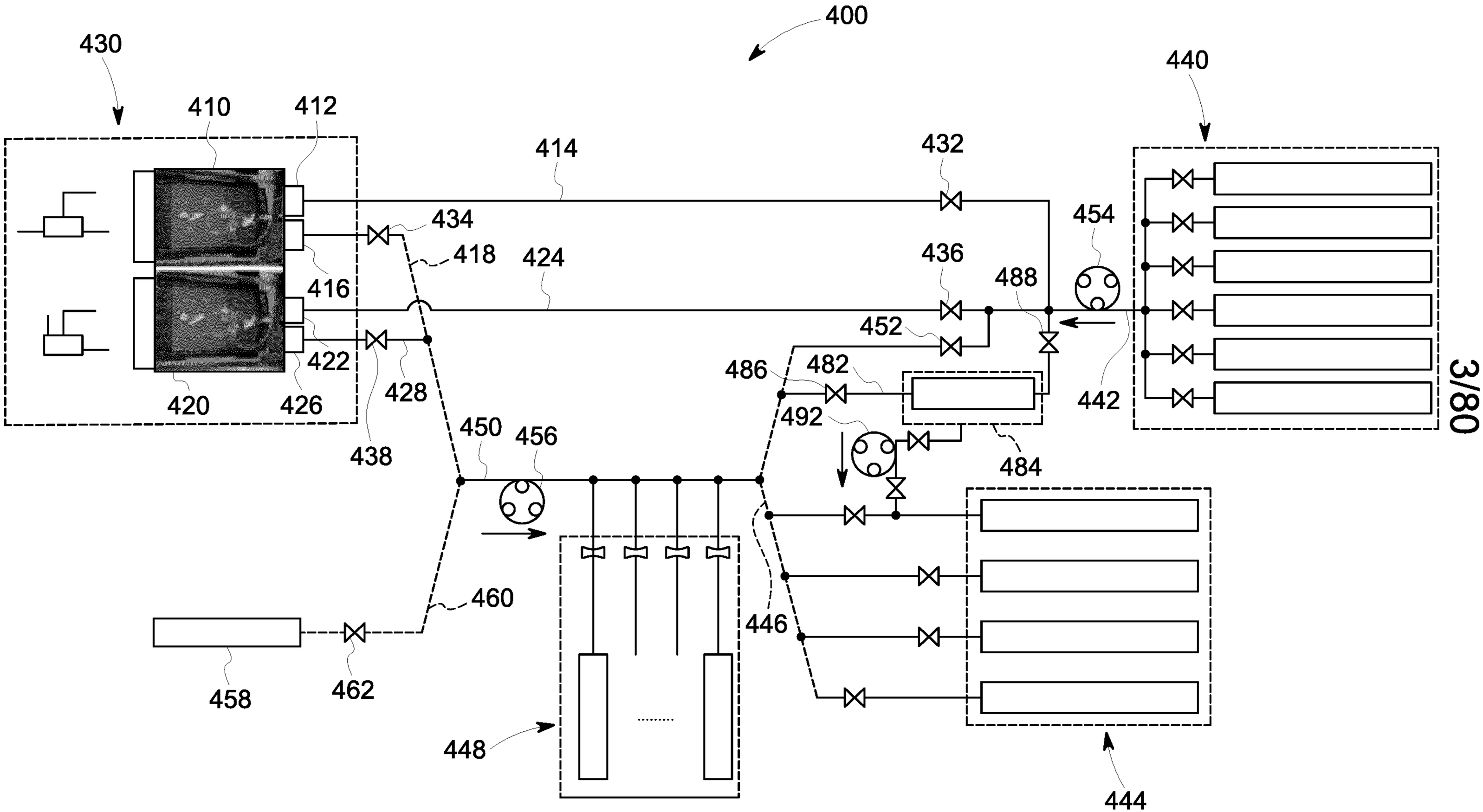

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448
444

FIG. 3

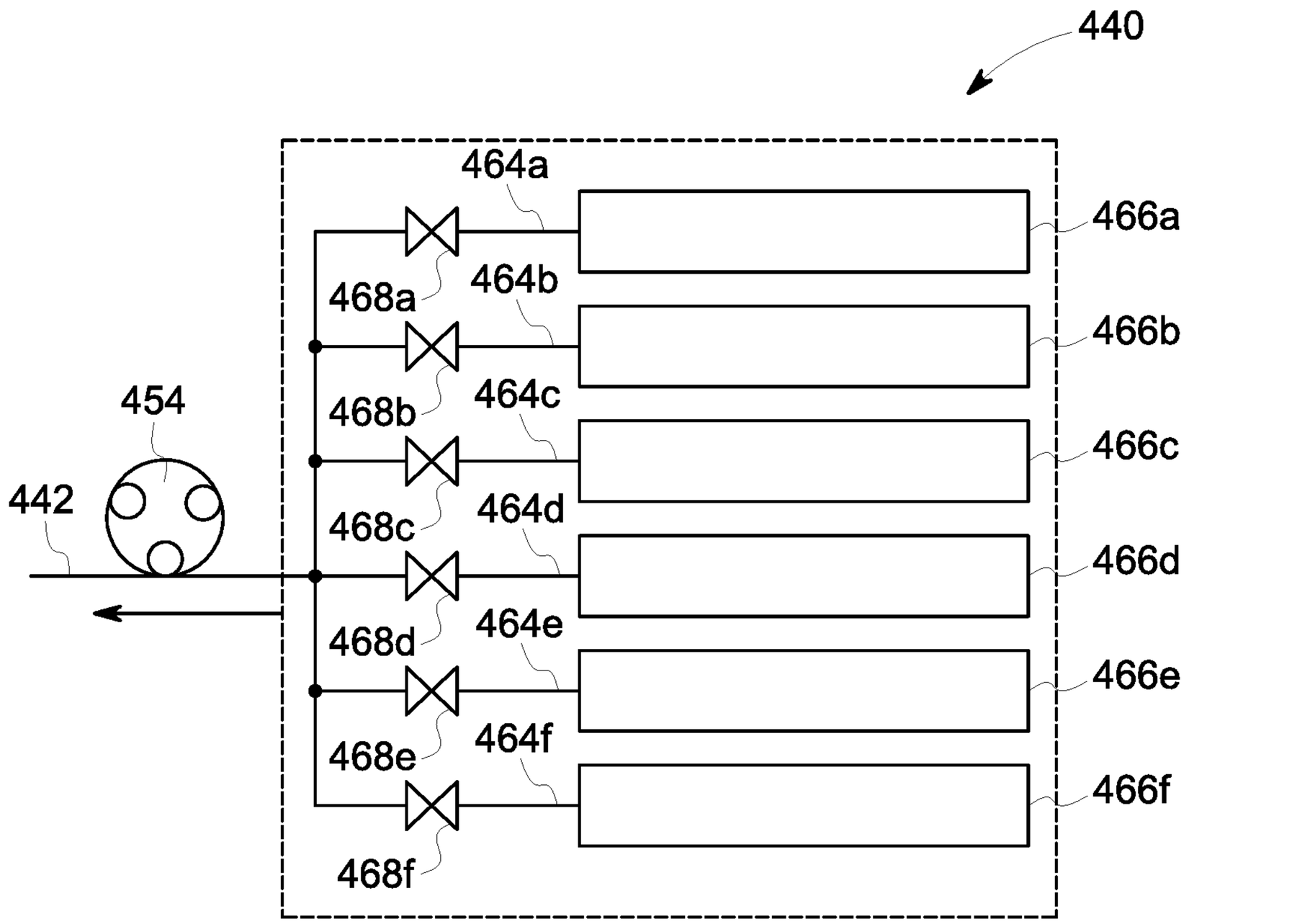

440
464a
466a
468a
464b
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464c
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FIG. 4

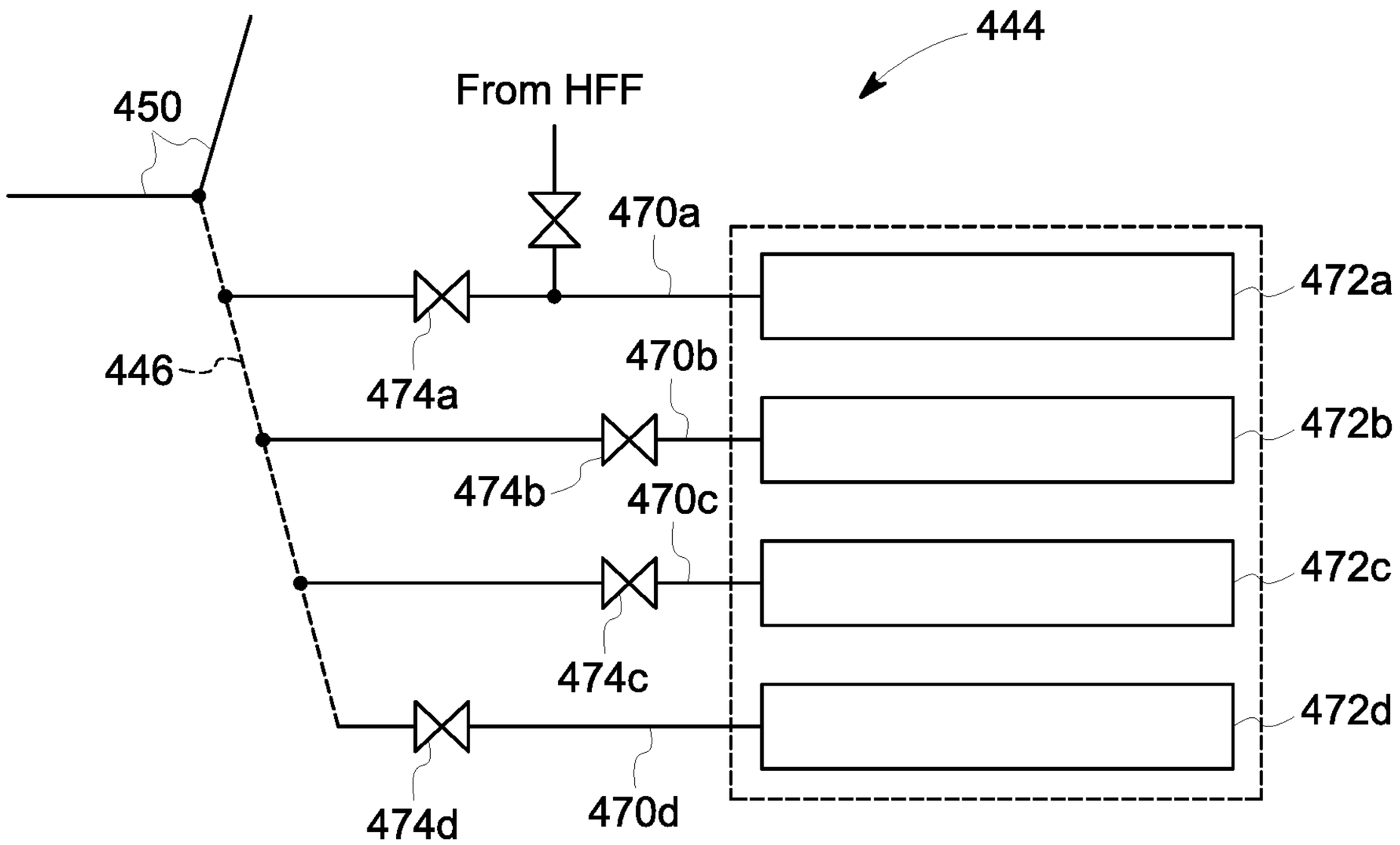

444
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From HFF
470a
472a
446
470b
474a
472b
474b
470c
472c
474c
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474d
470d

FIG. 5

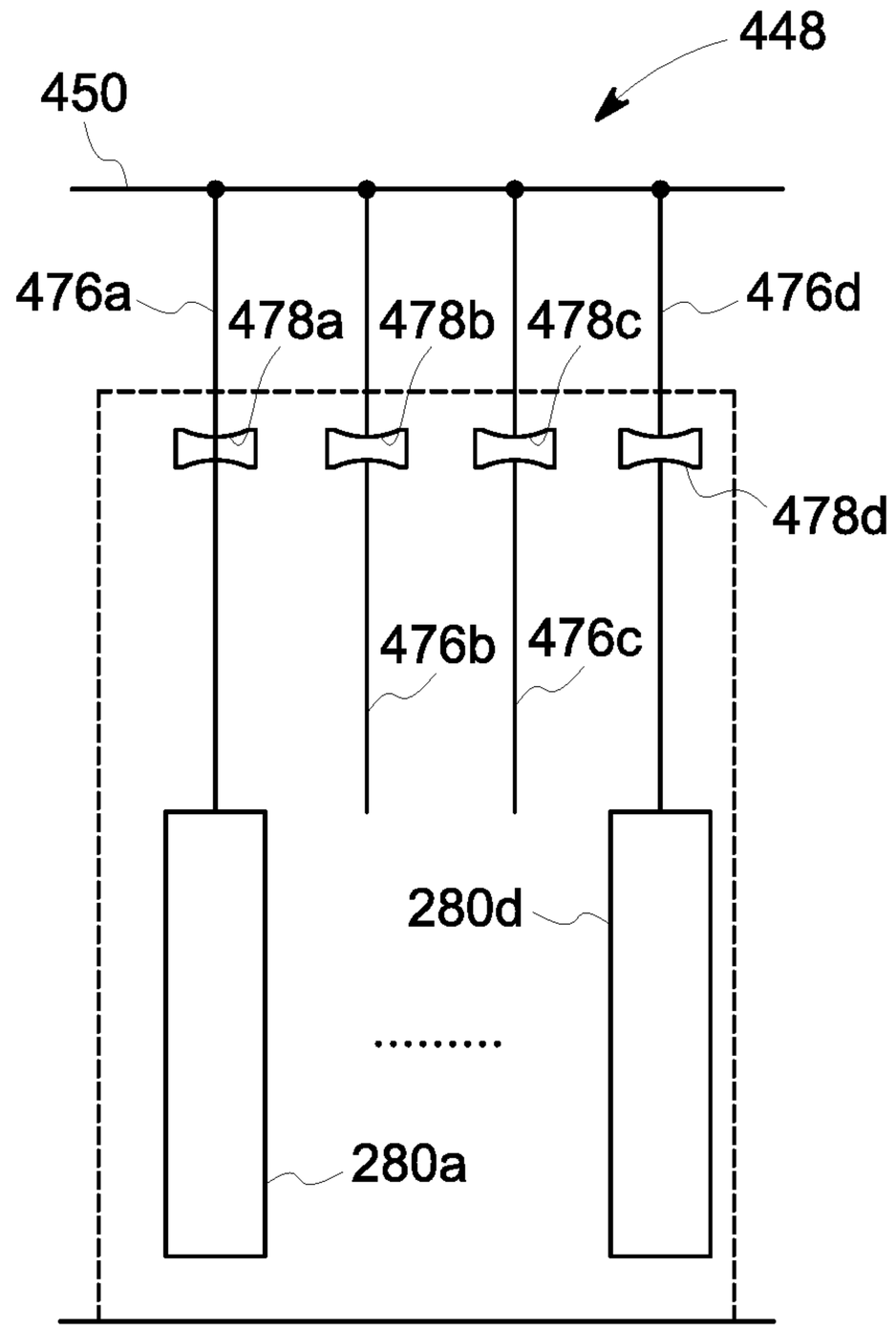

448
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476a
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478b
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476d
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476b
476c
280d
280a

FIG. 6

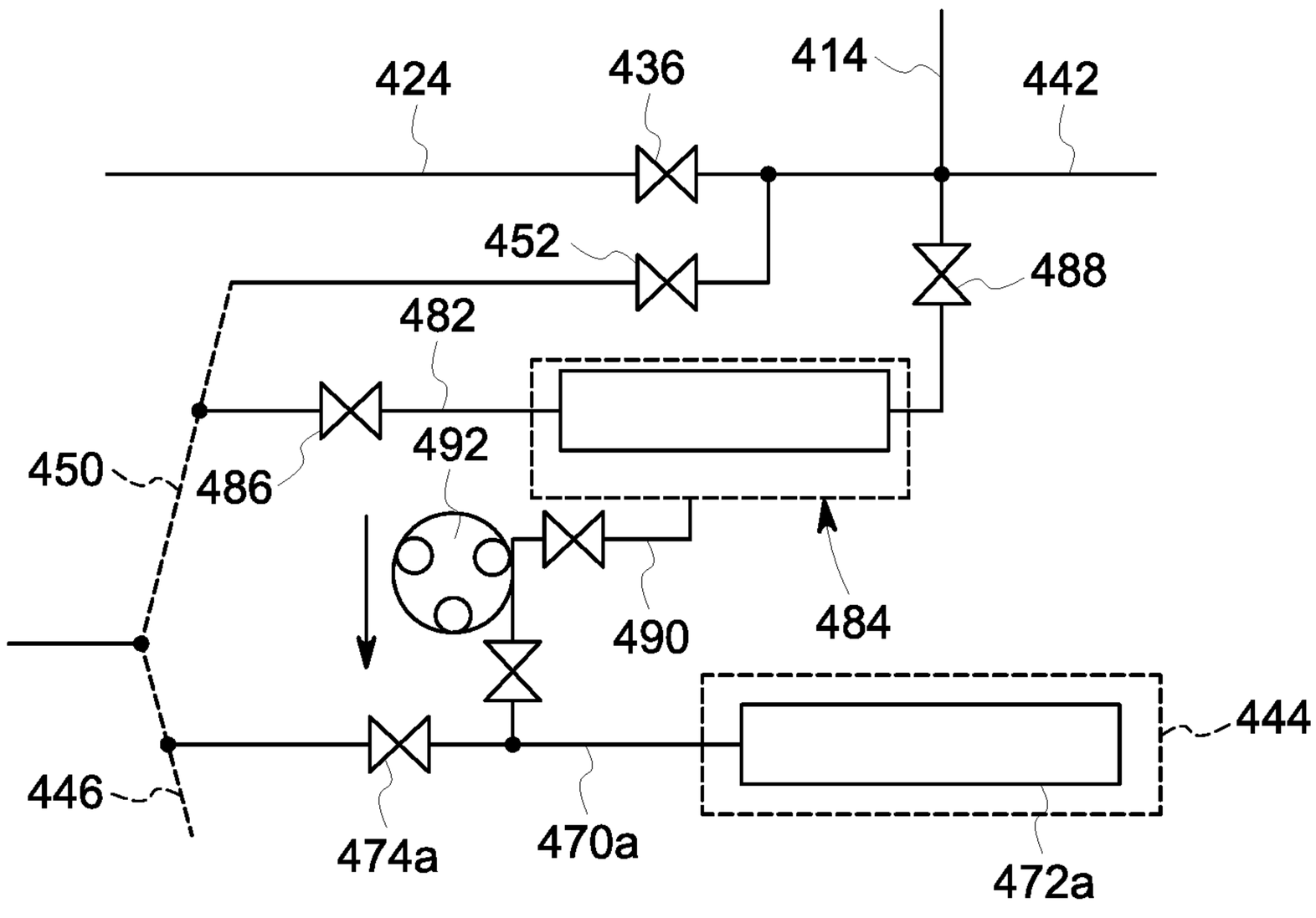

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470a
472a

FIG. 7

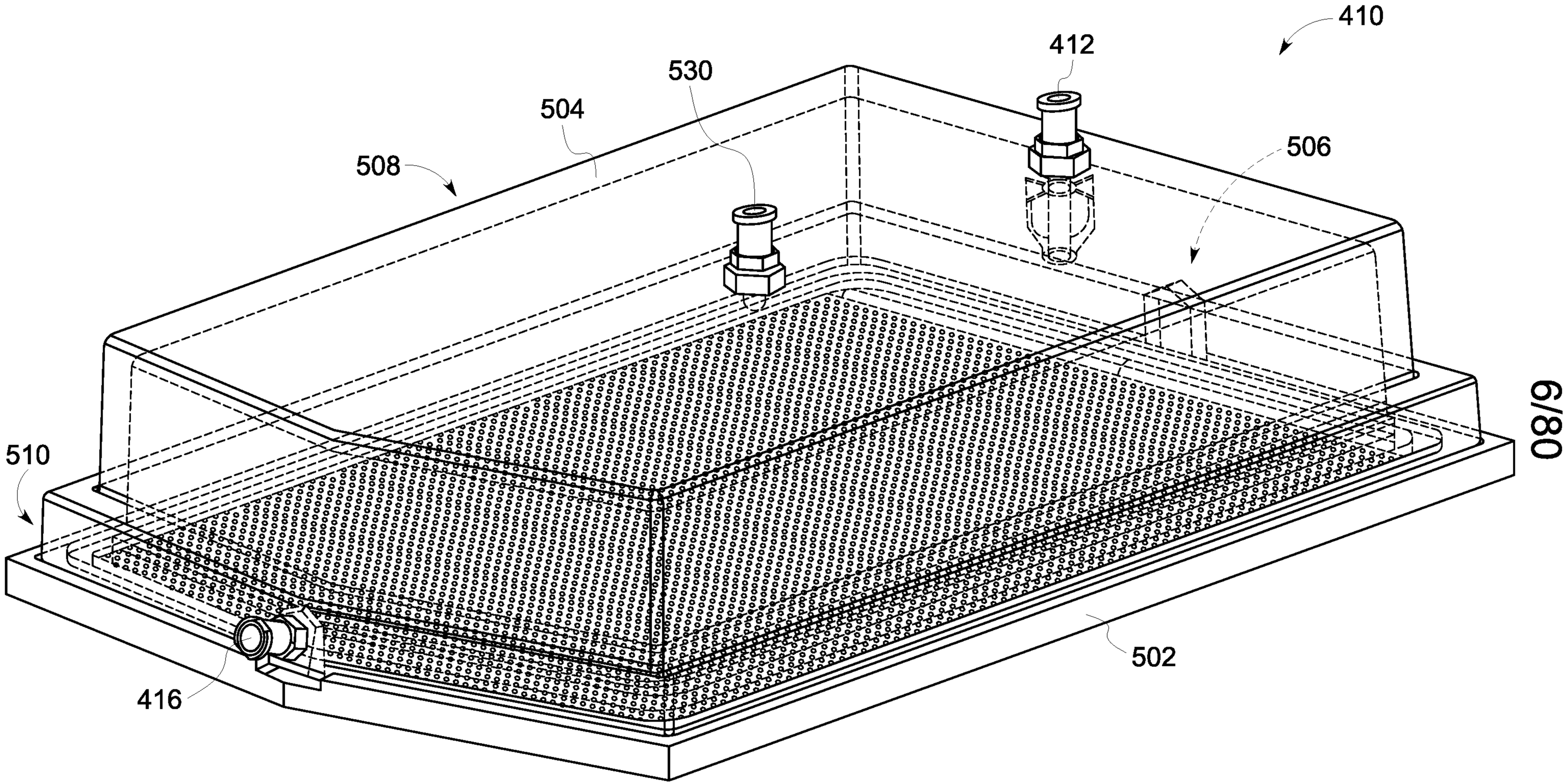


FIG. 8

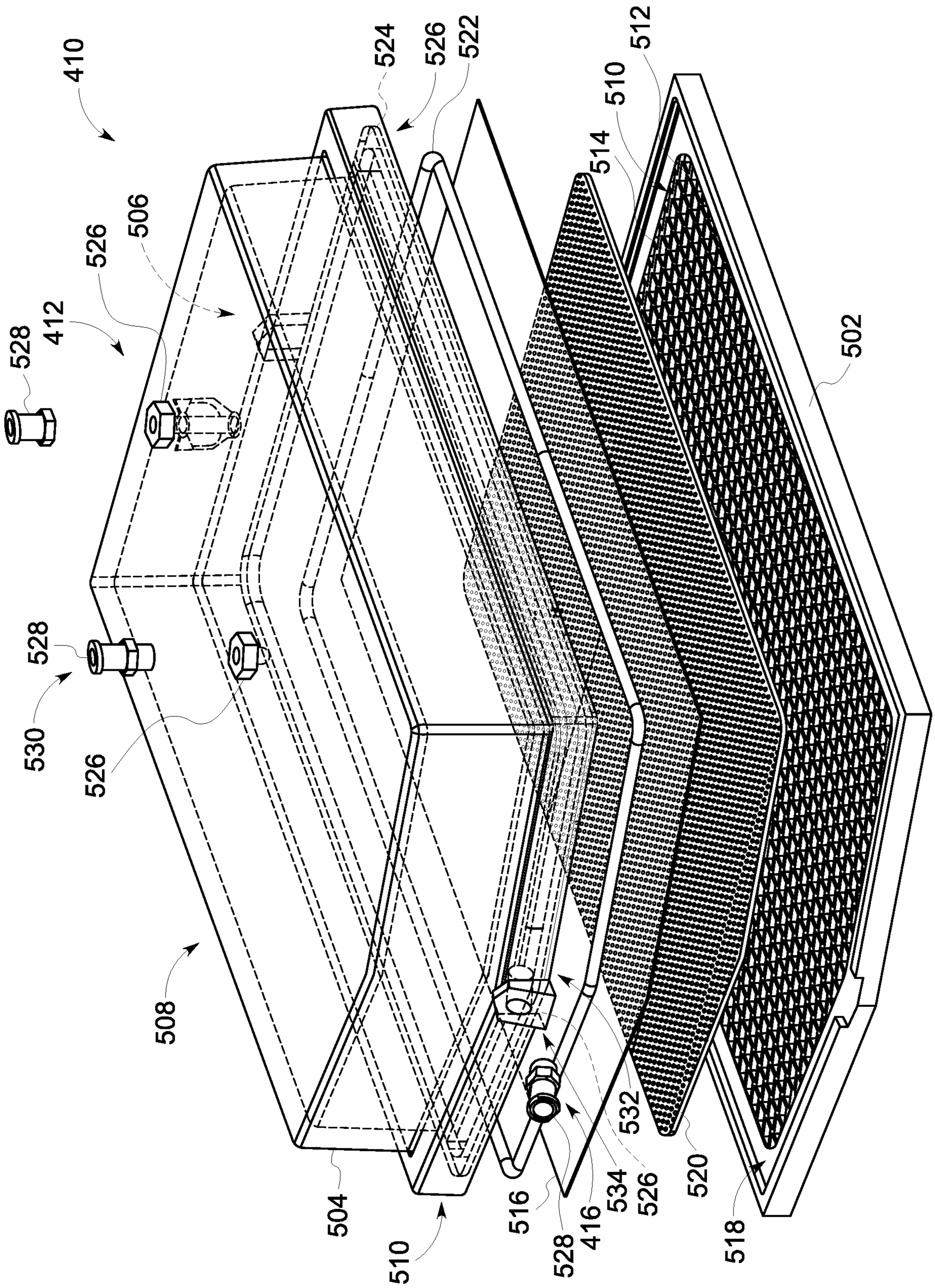

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FIG. 9

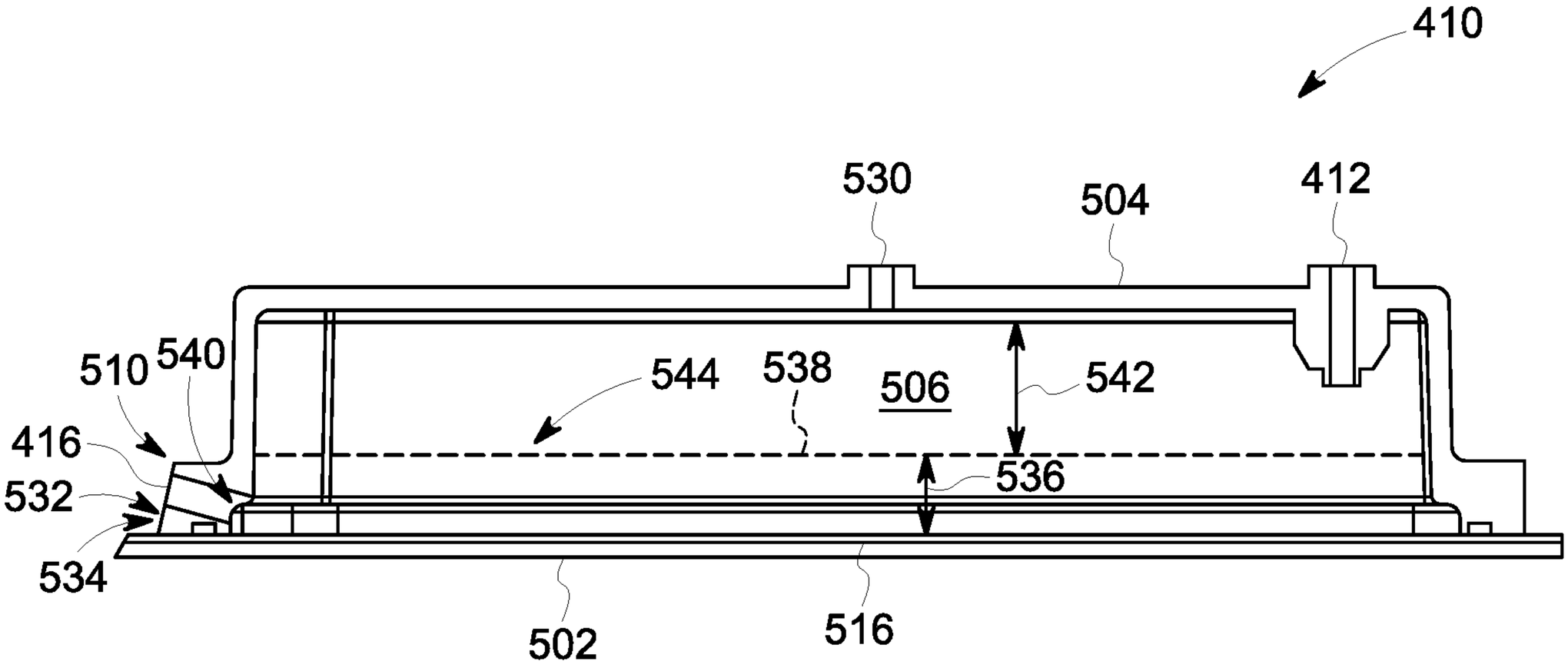


FIG. 10

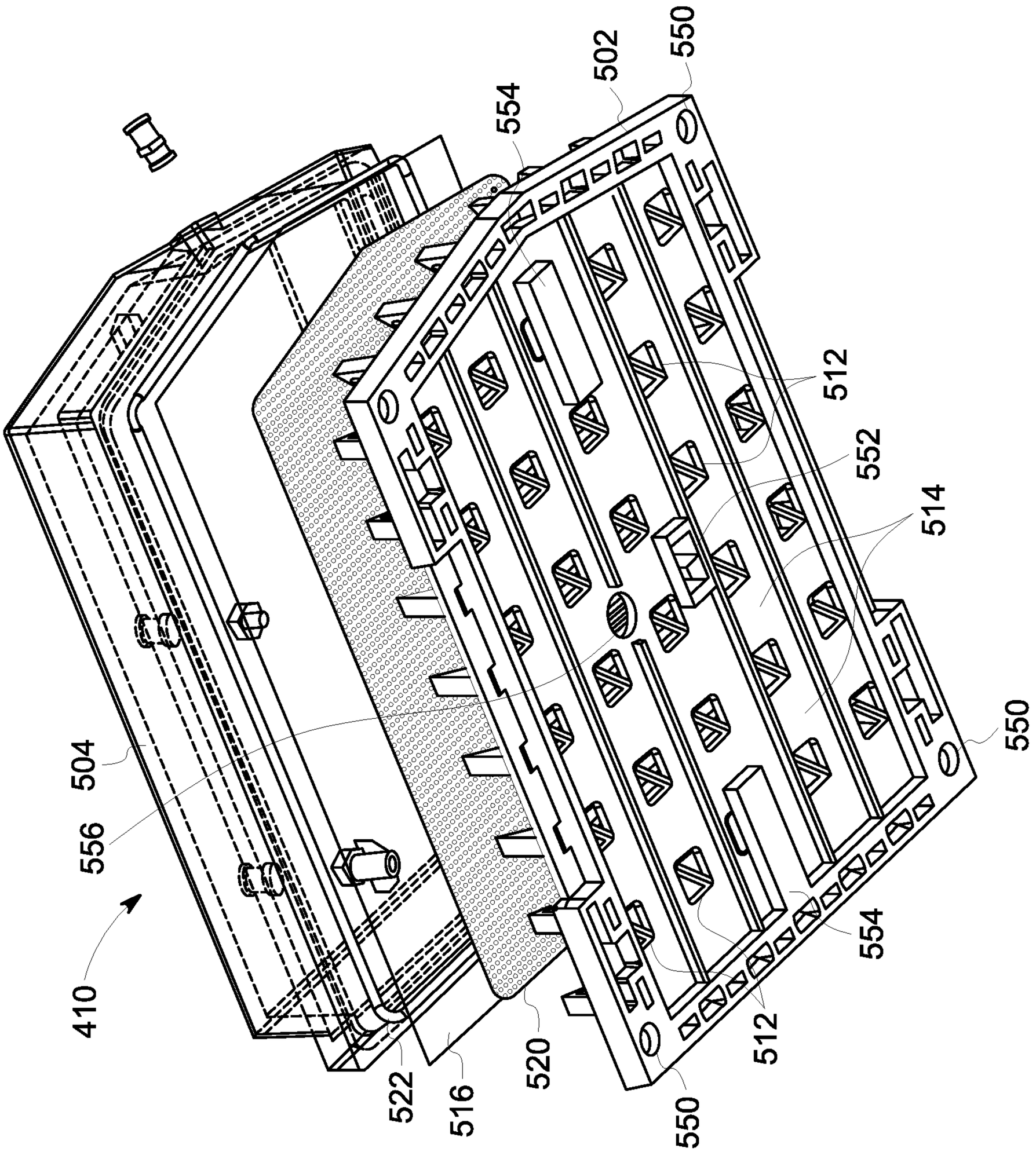


FIG. 11

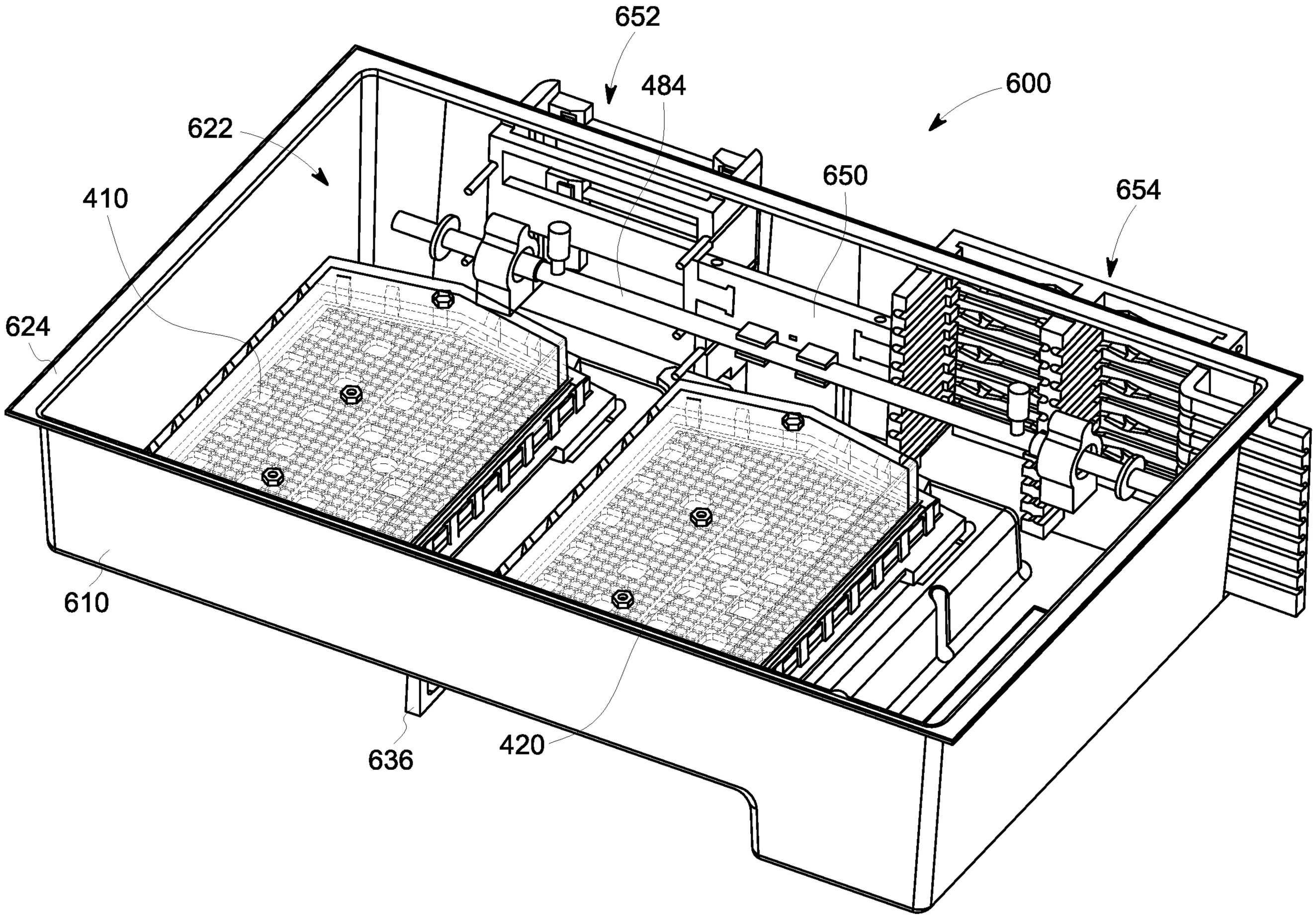


FIG. 12

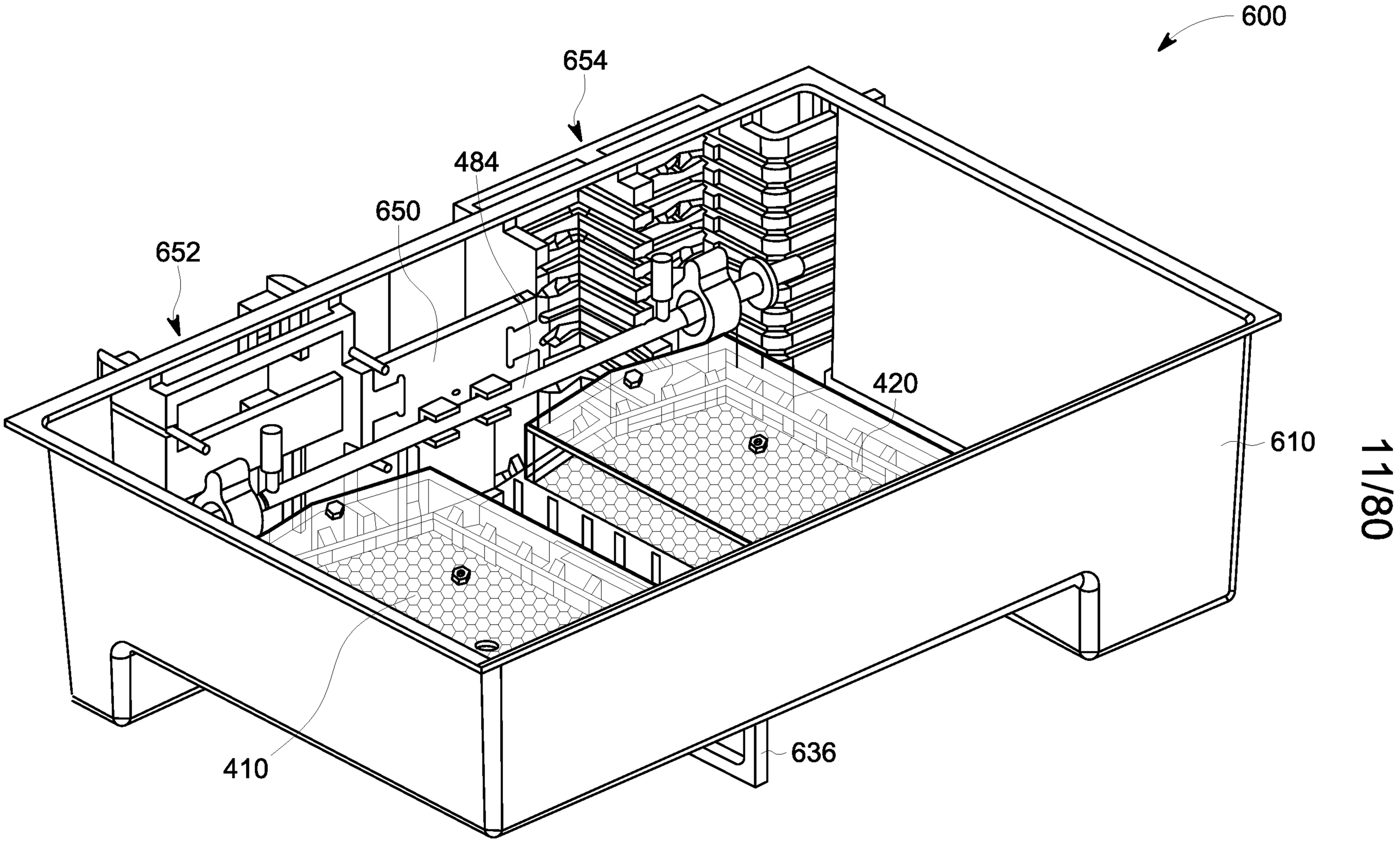


FIG. 13

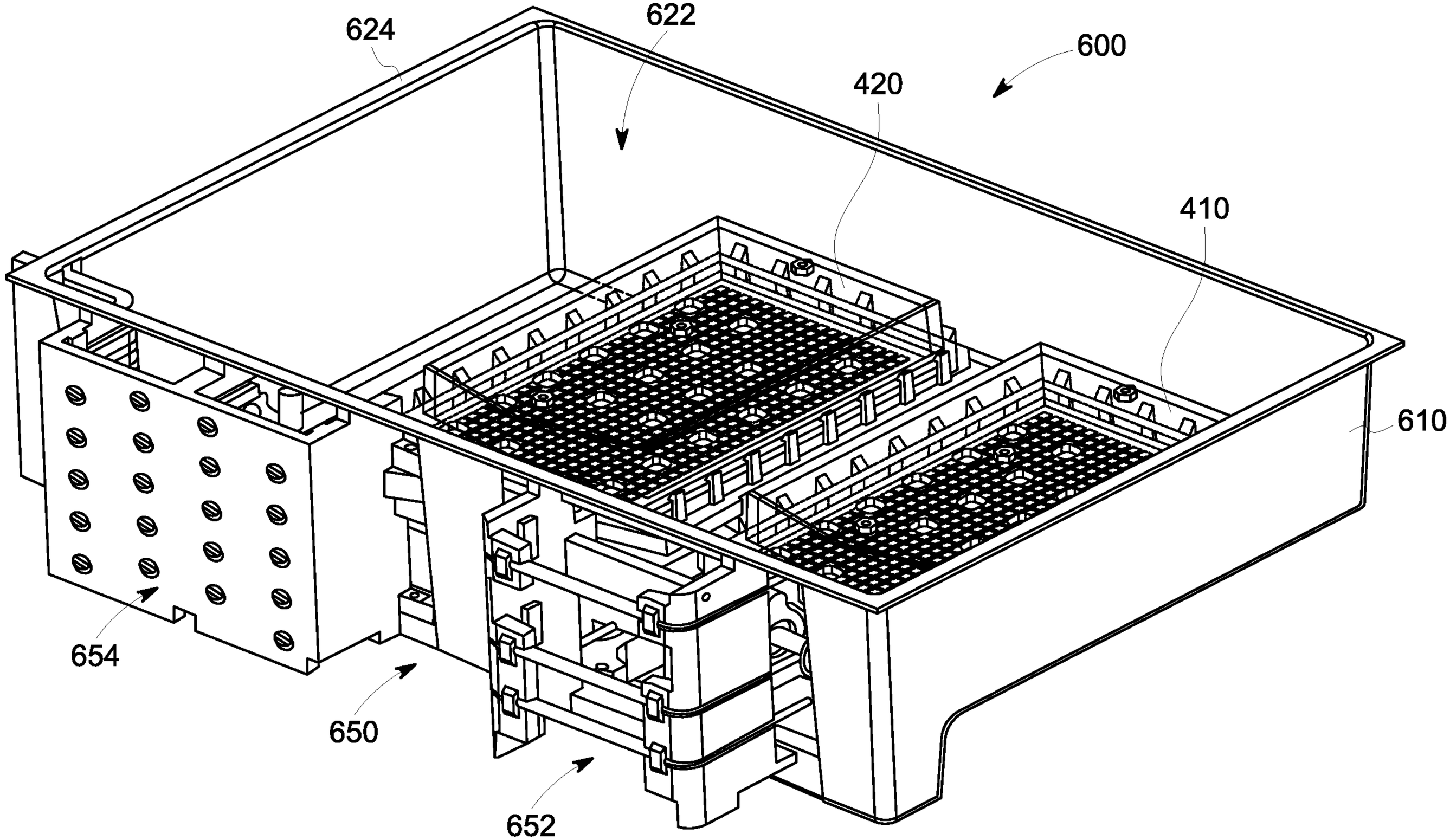


FIG. 14

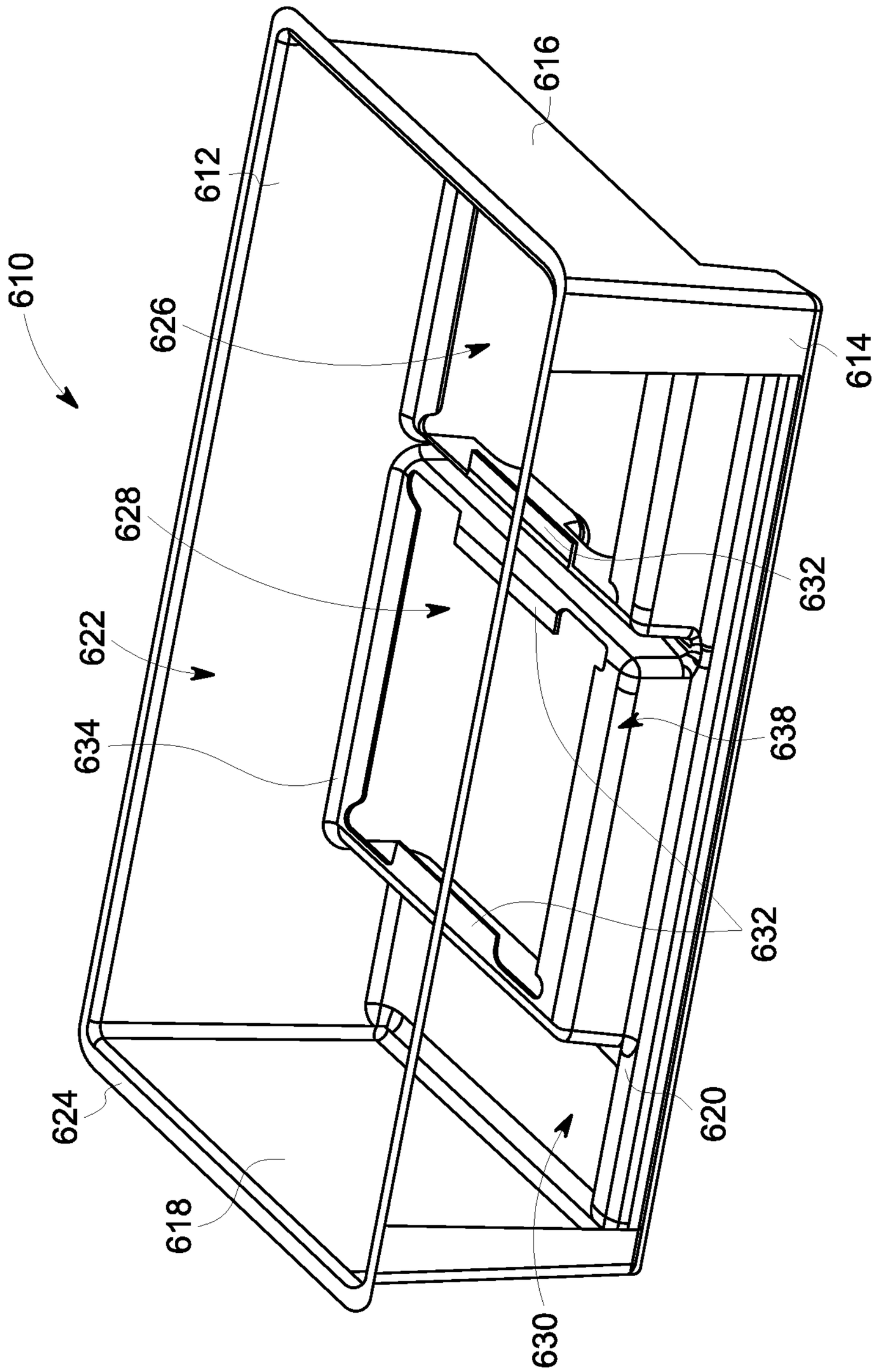


FIG. 15

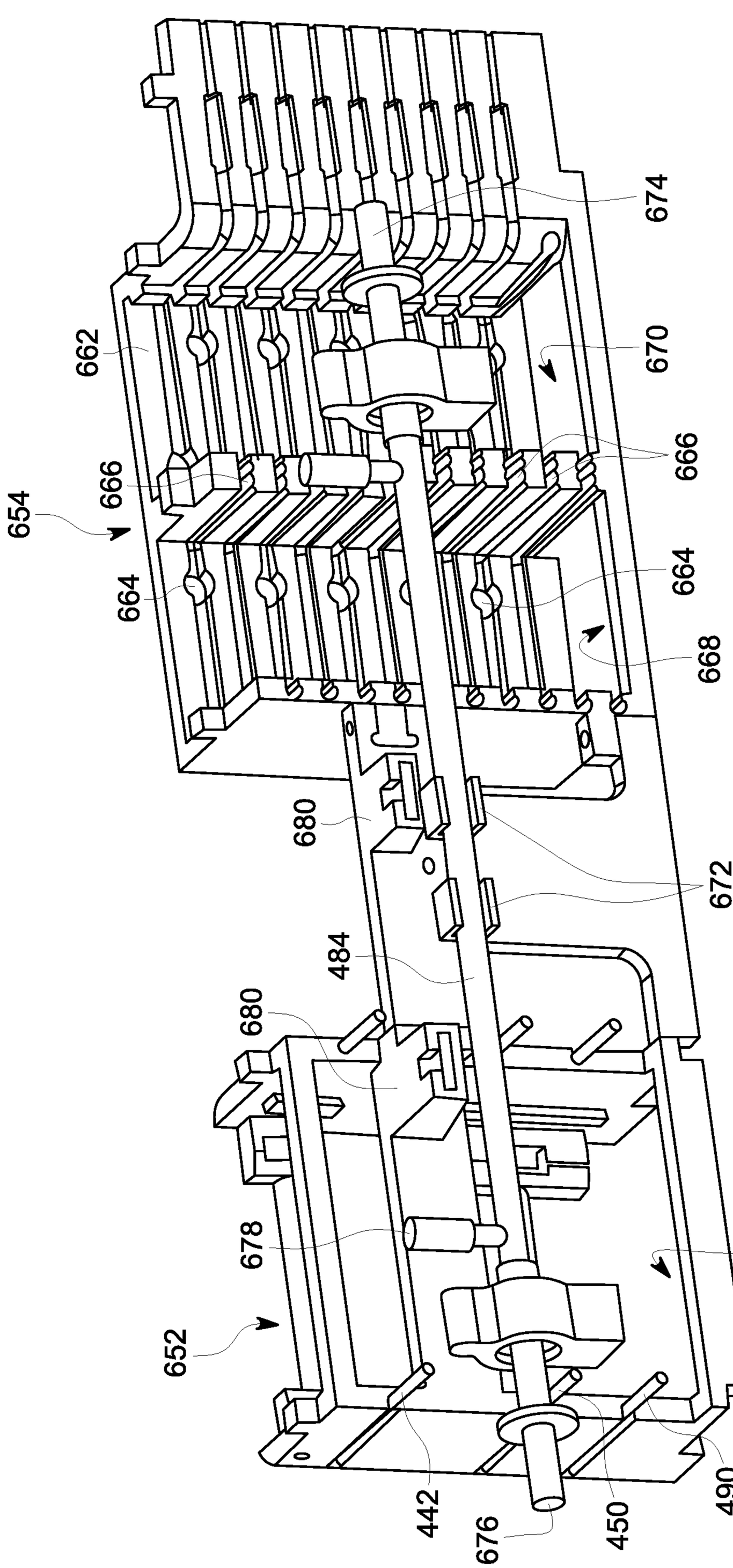

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FIG. 16

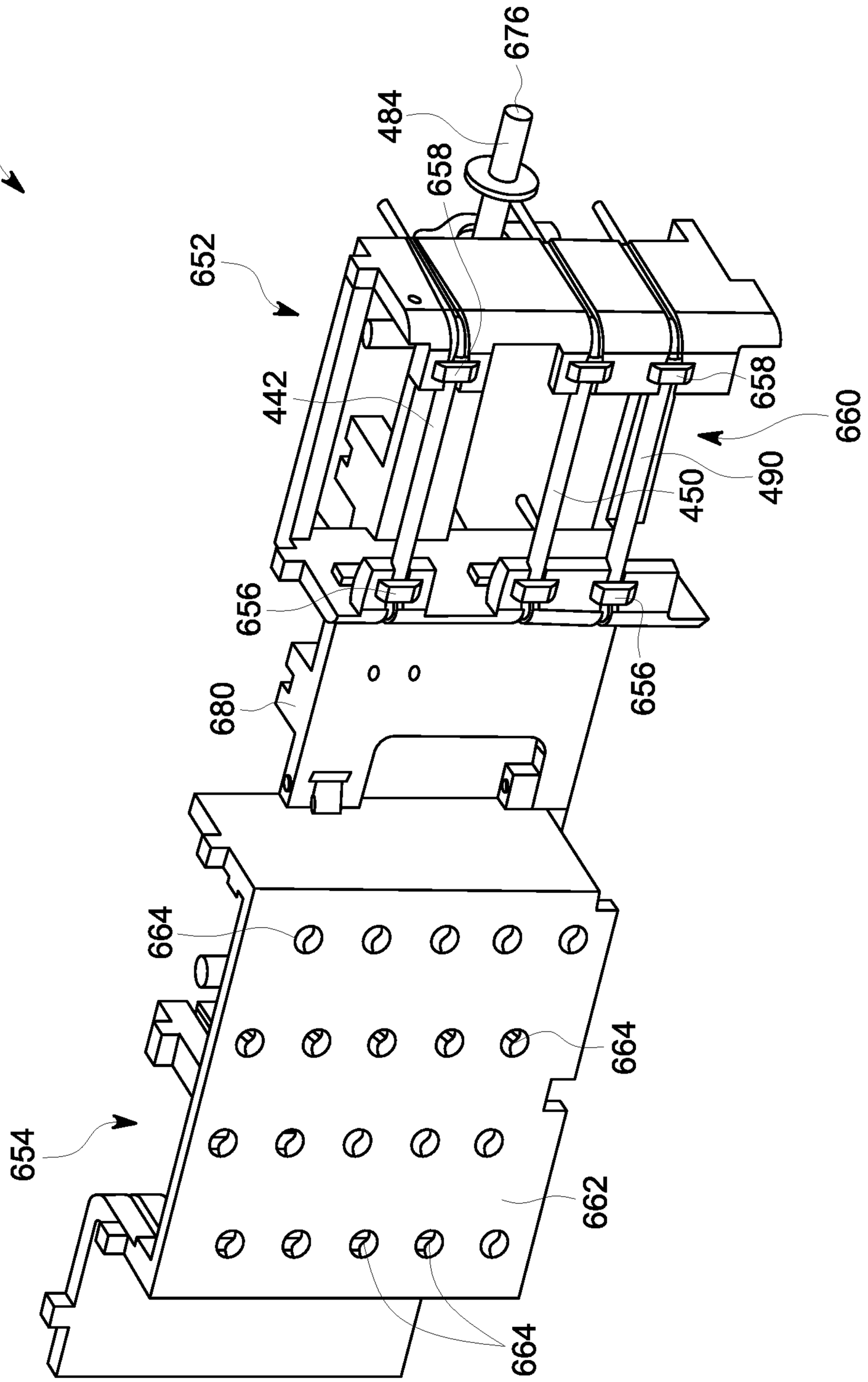

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FIG. 17

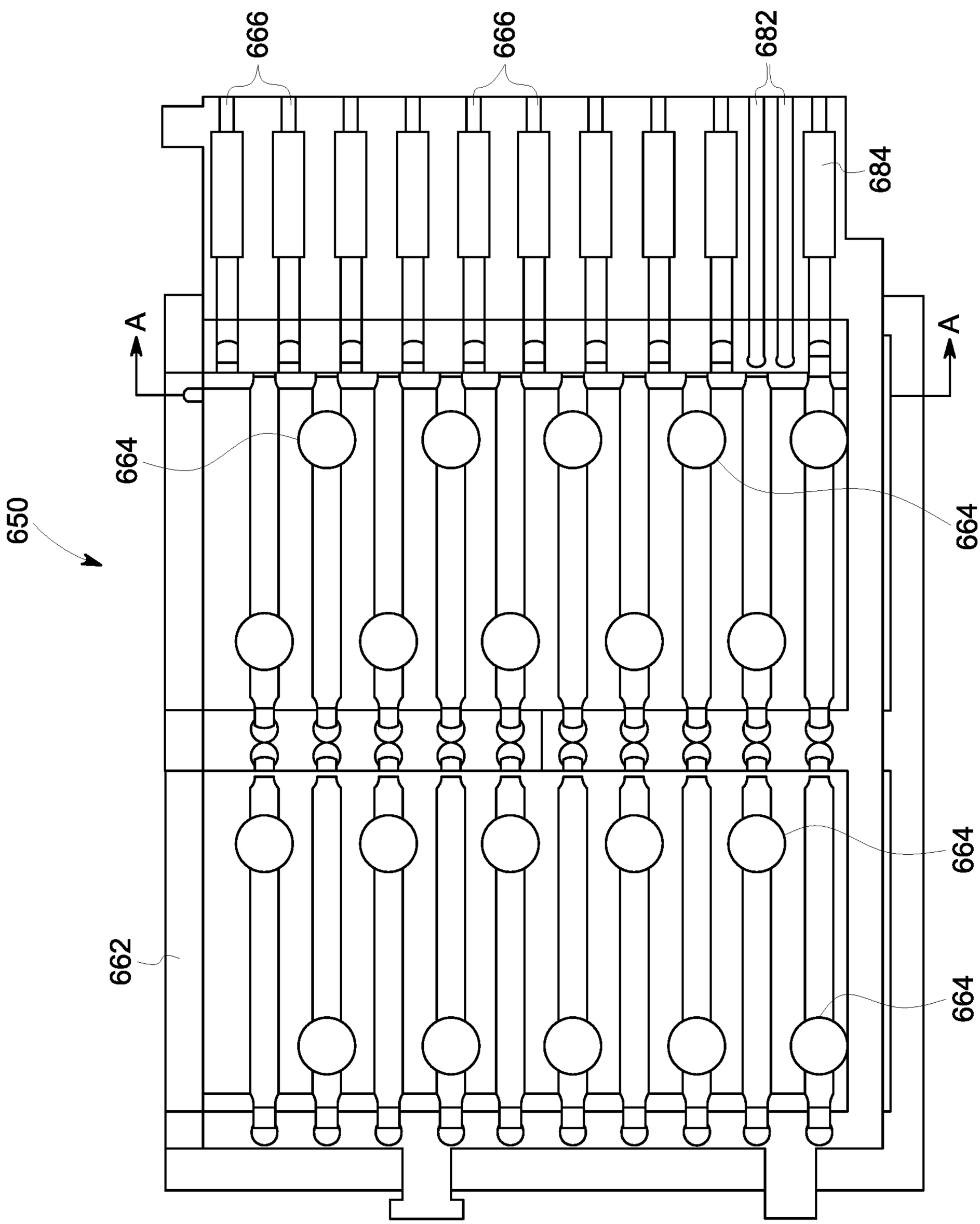


FIG. 18

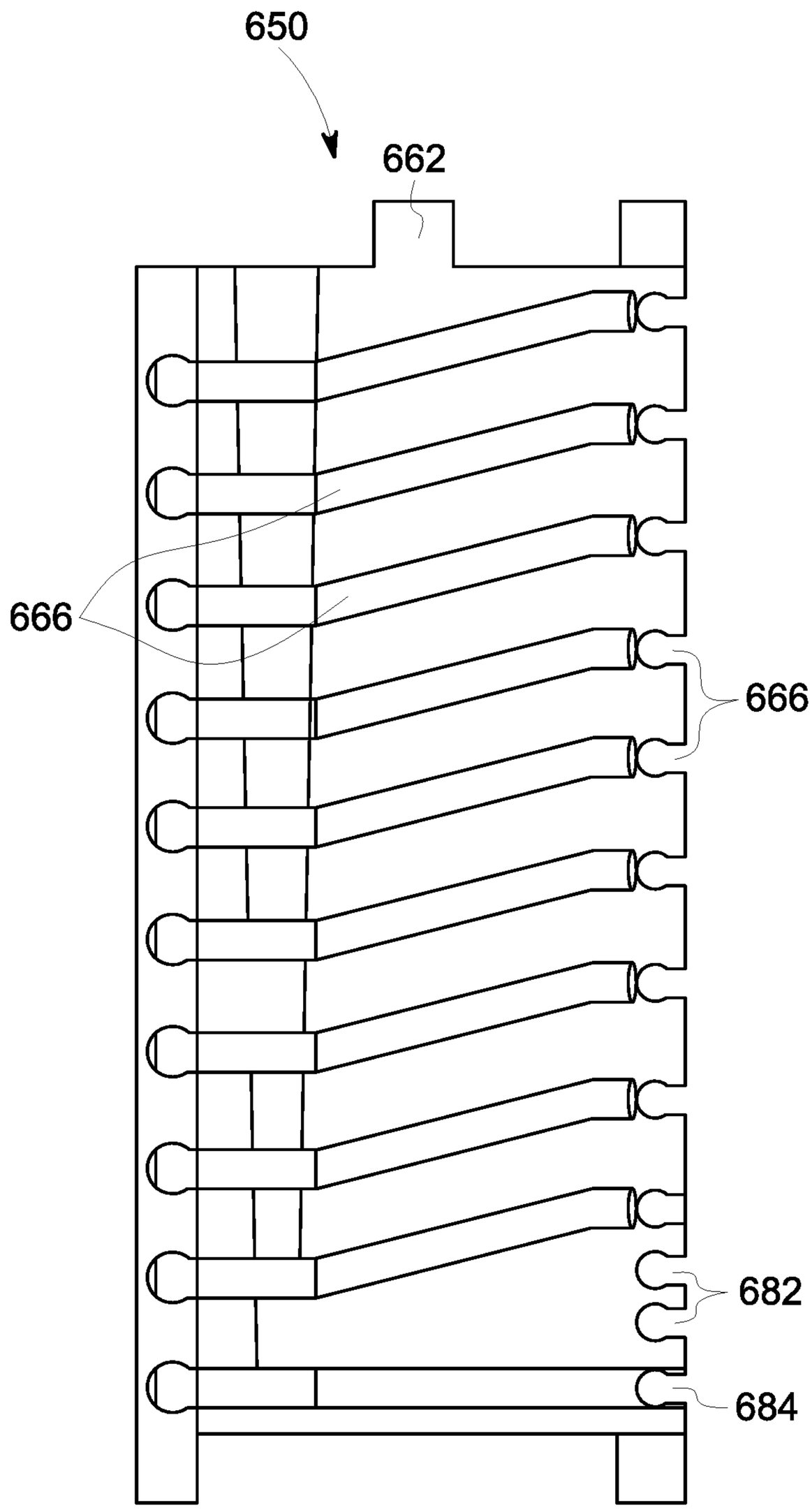


FIG. 19

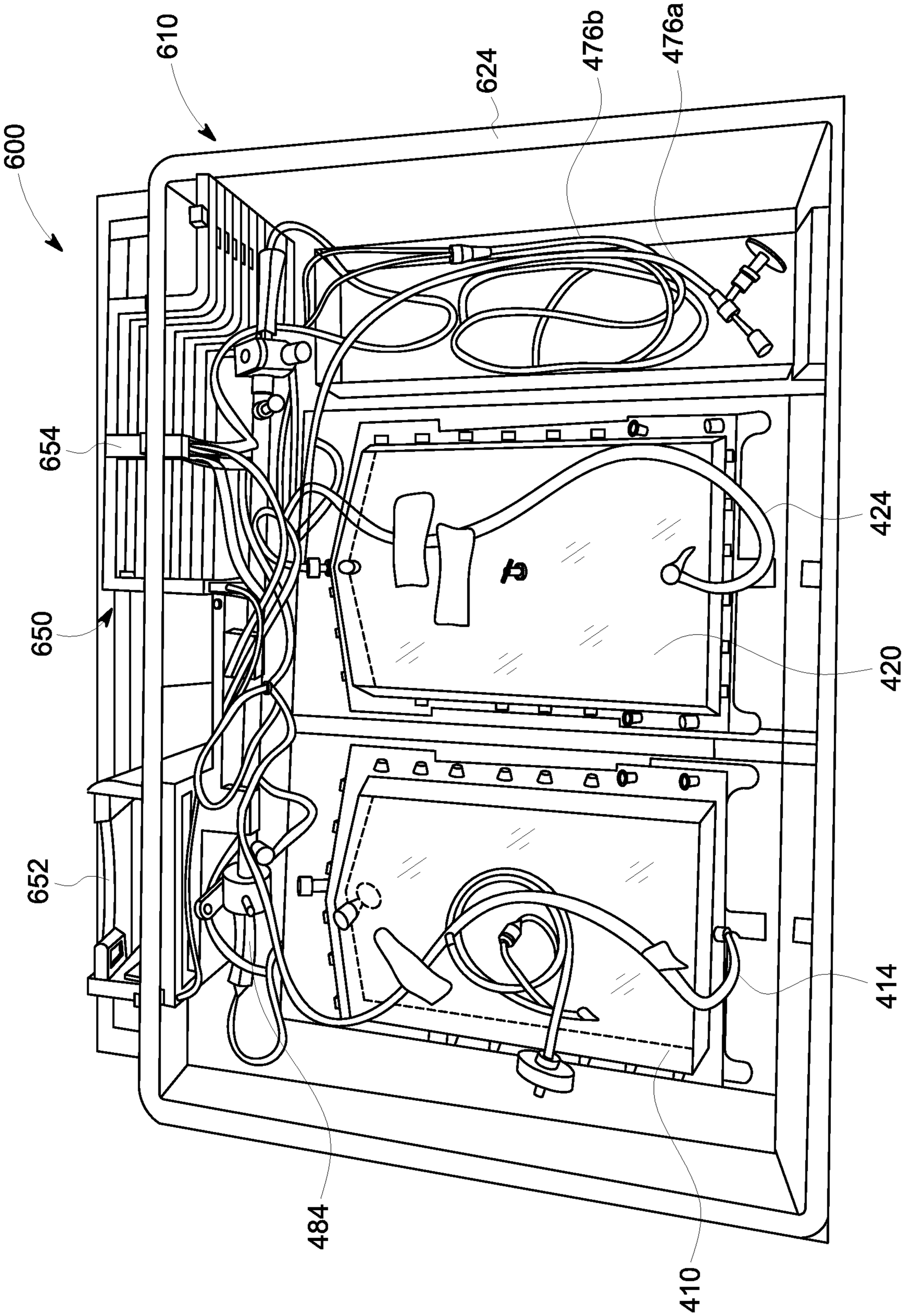


FIG. 20

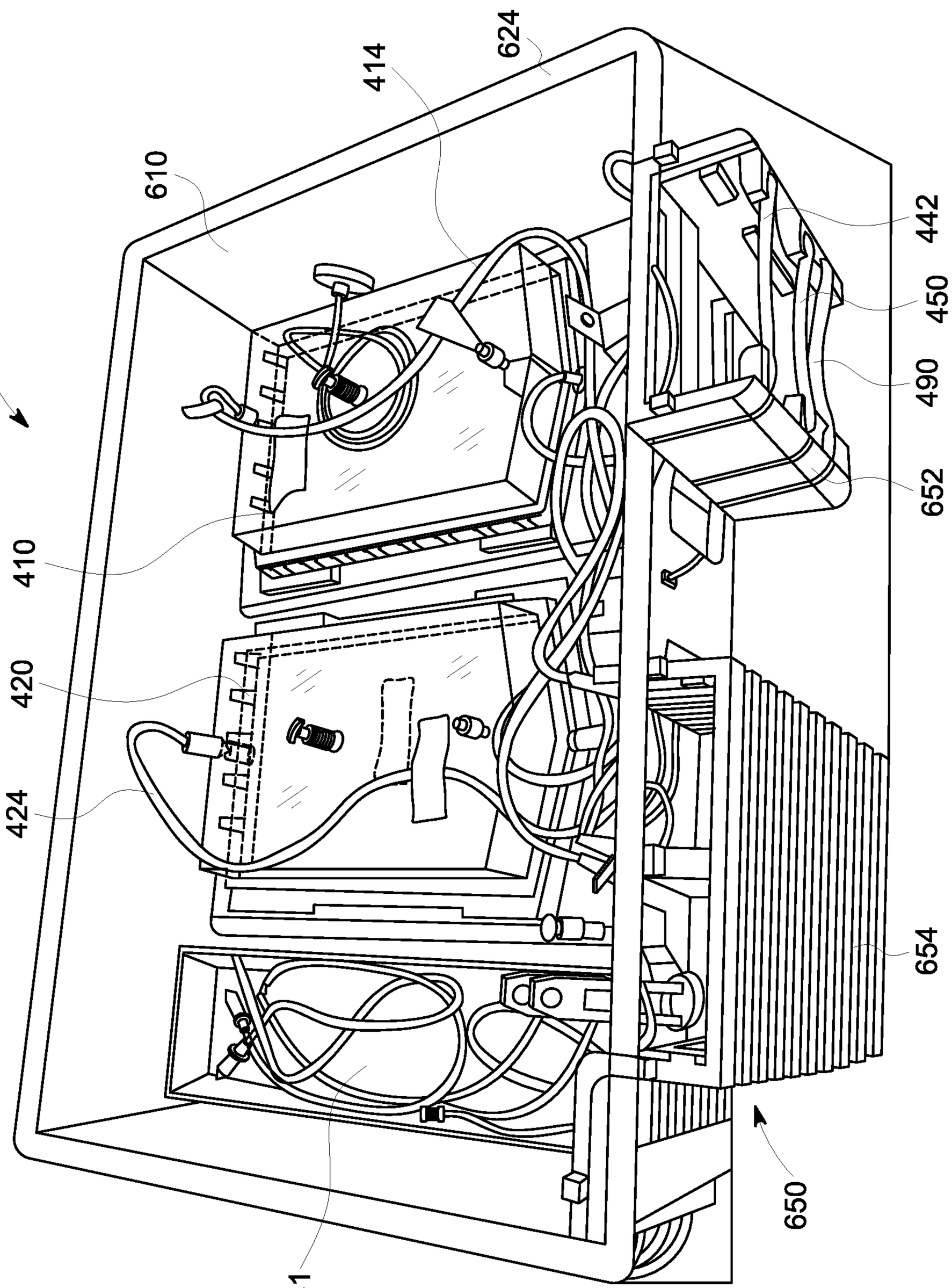


FIG. 21

20/80

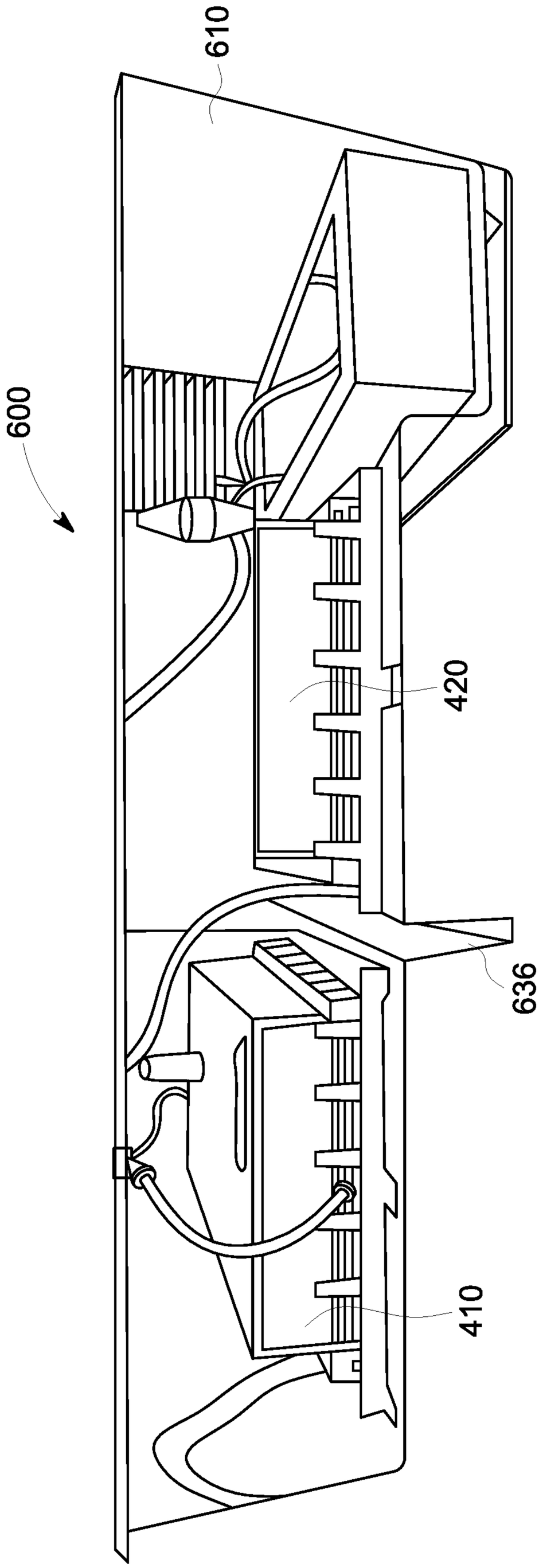


FIG. 22

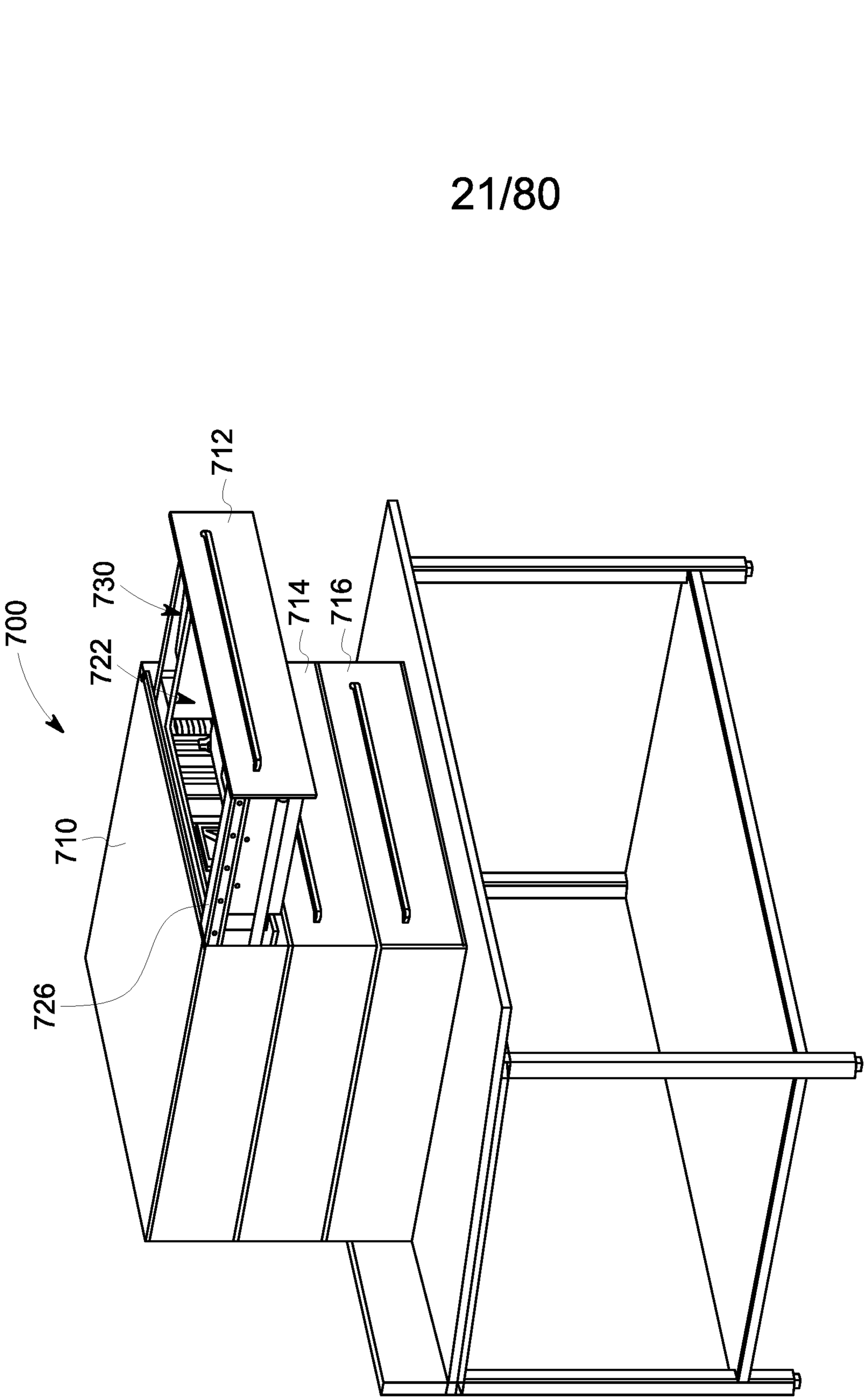


FIG. 23

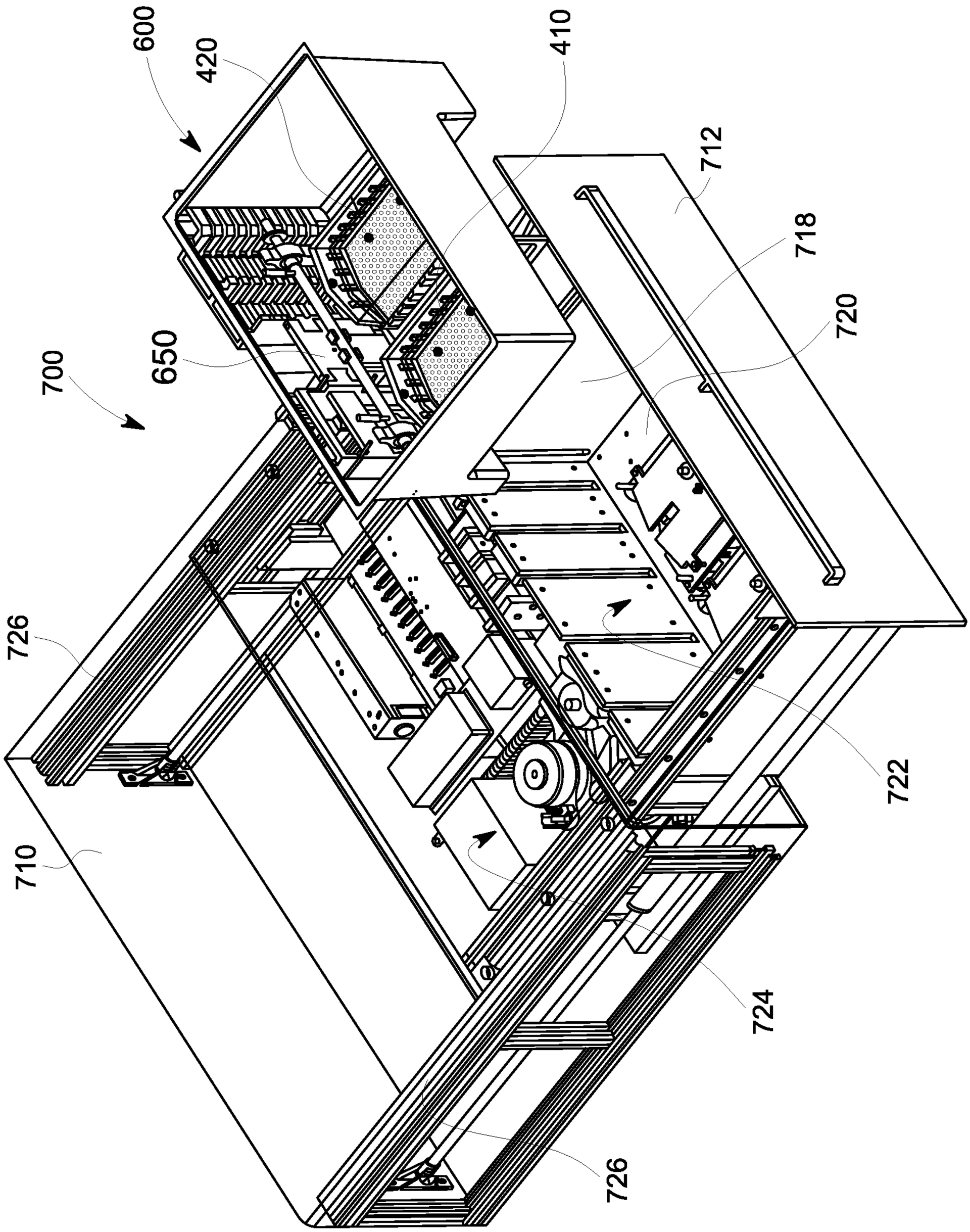


FIG. 24

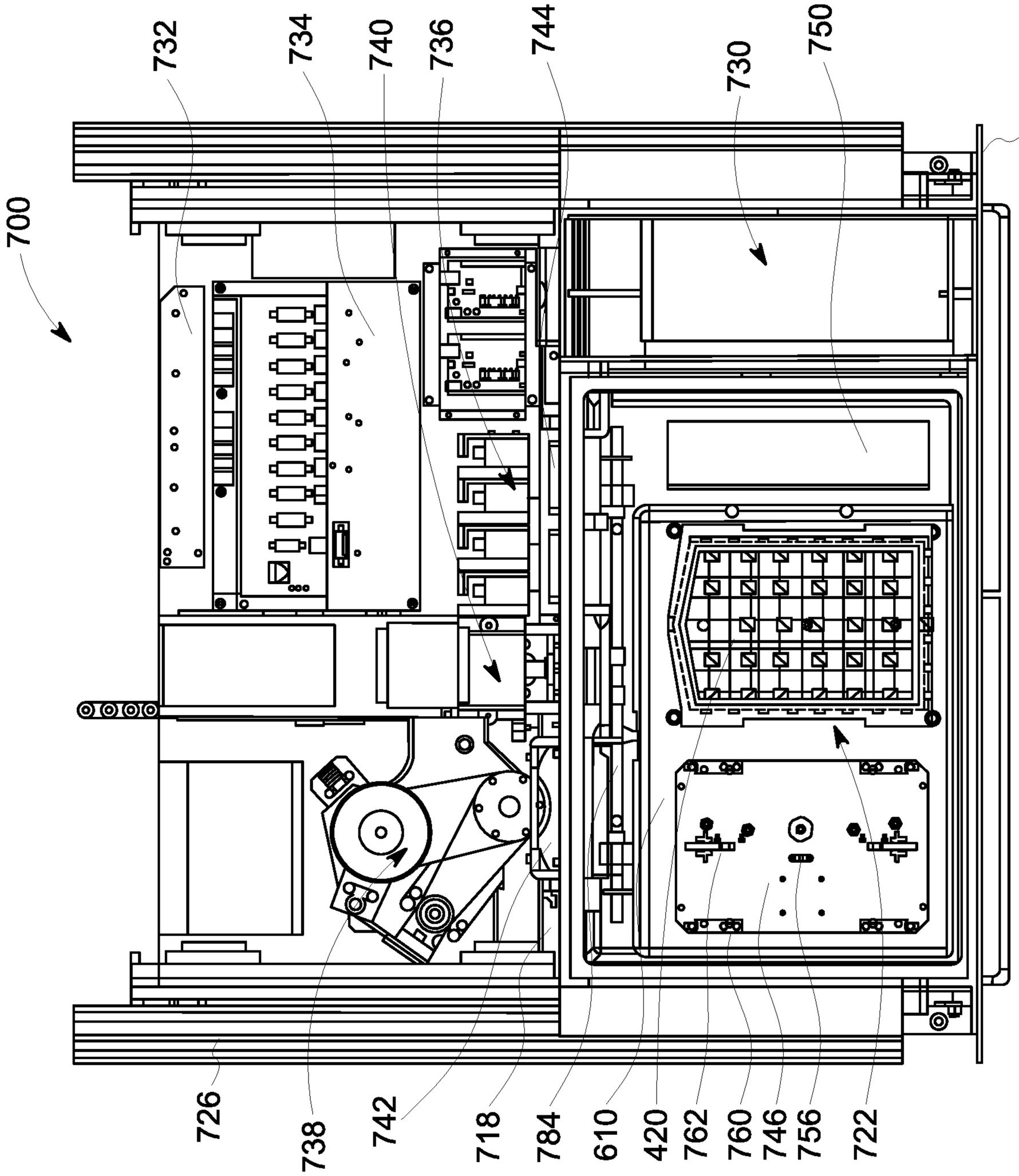

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FIG. 25

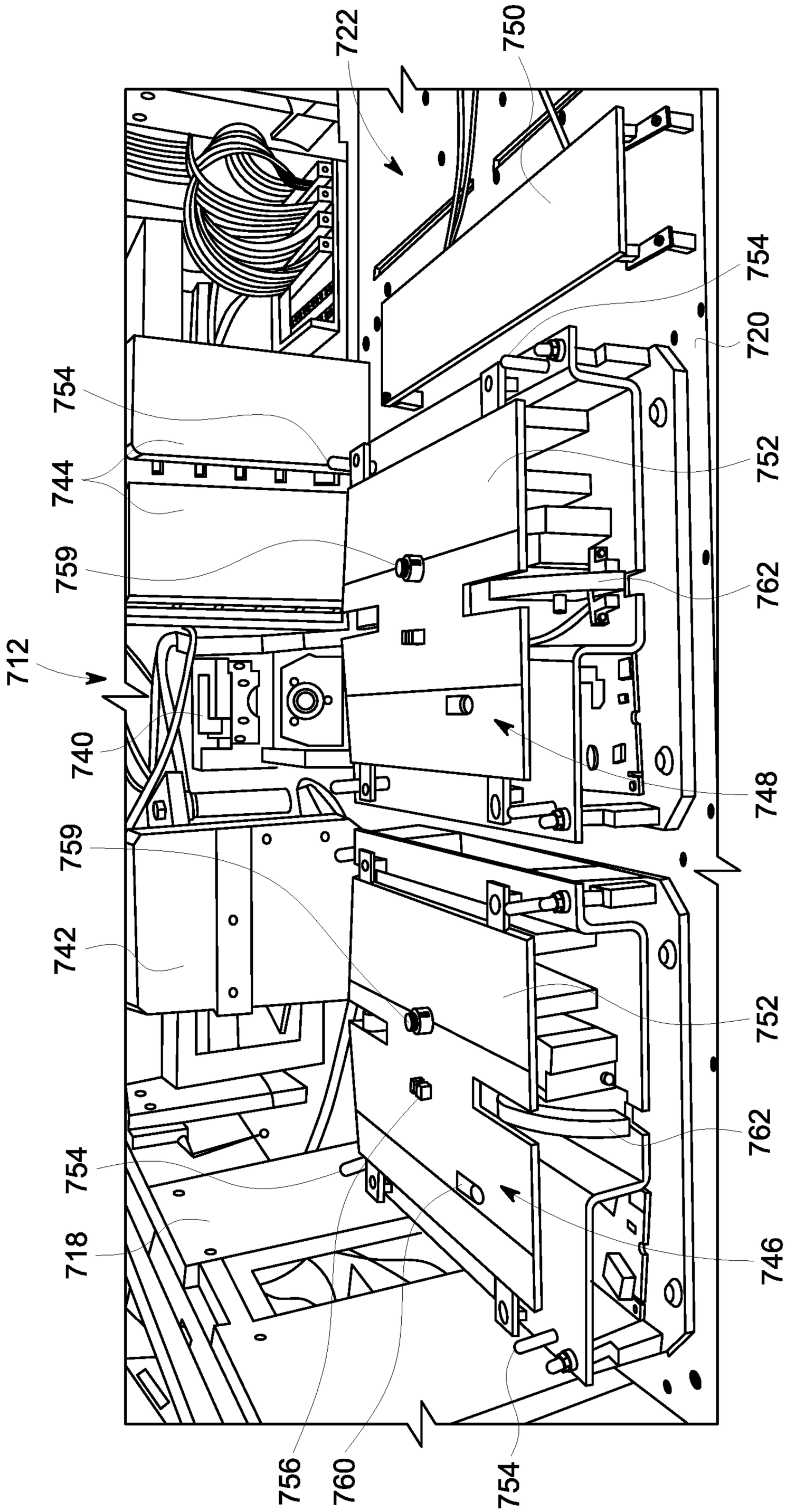

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FIG. 26

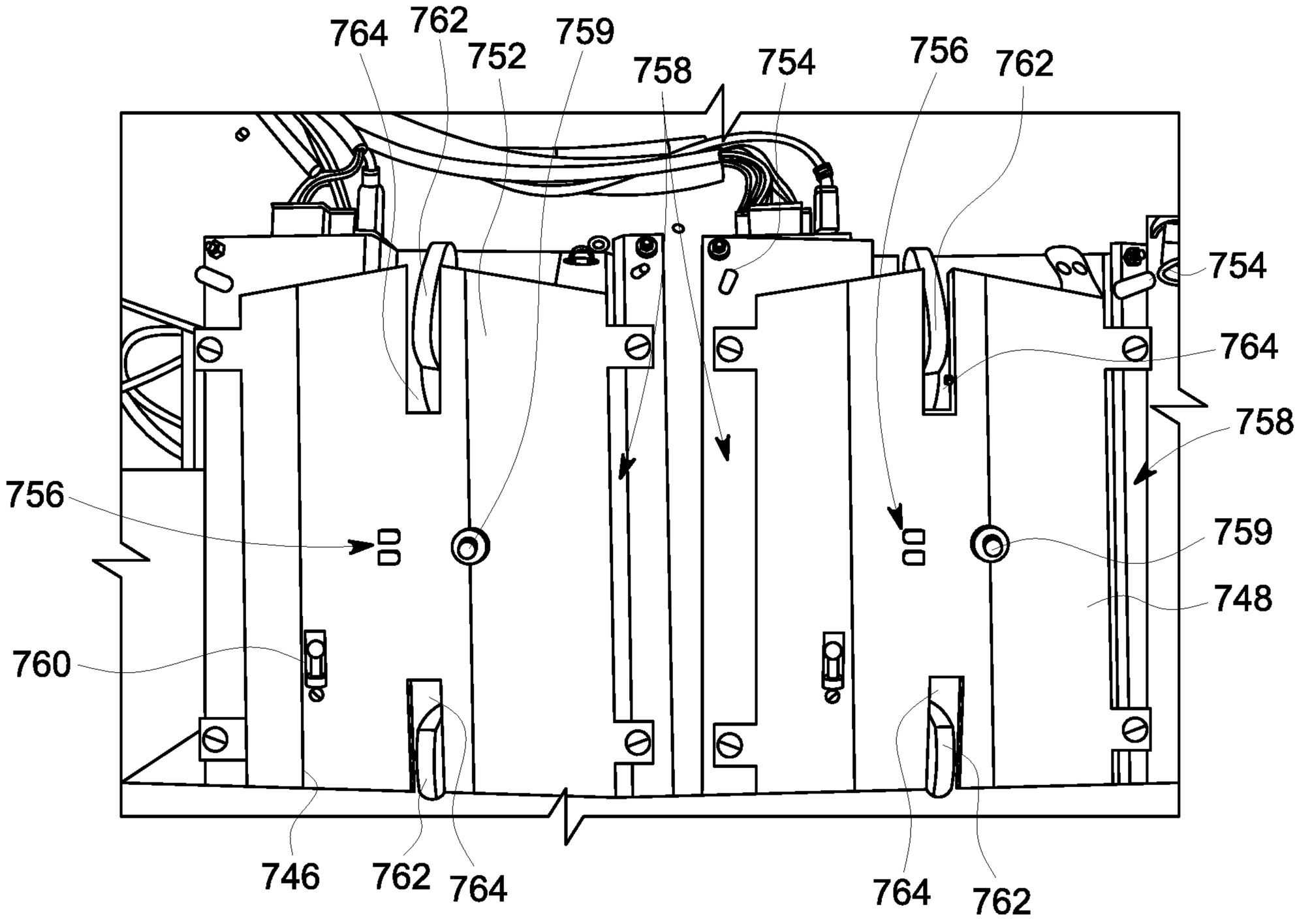

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FIG. 27

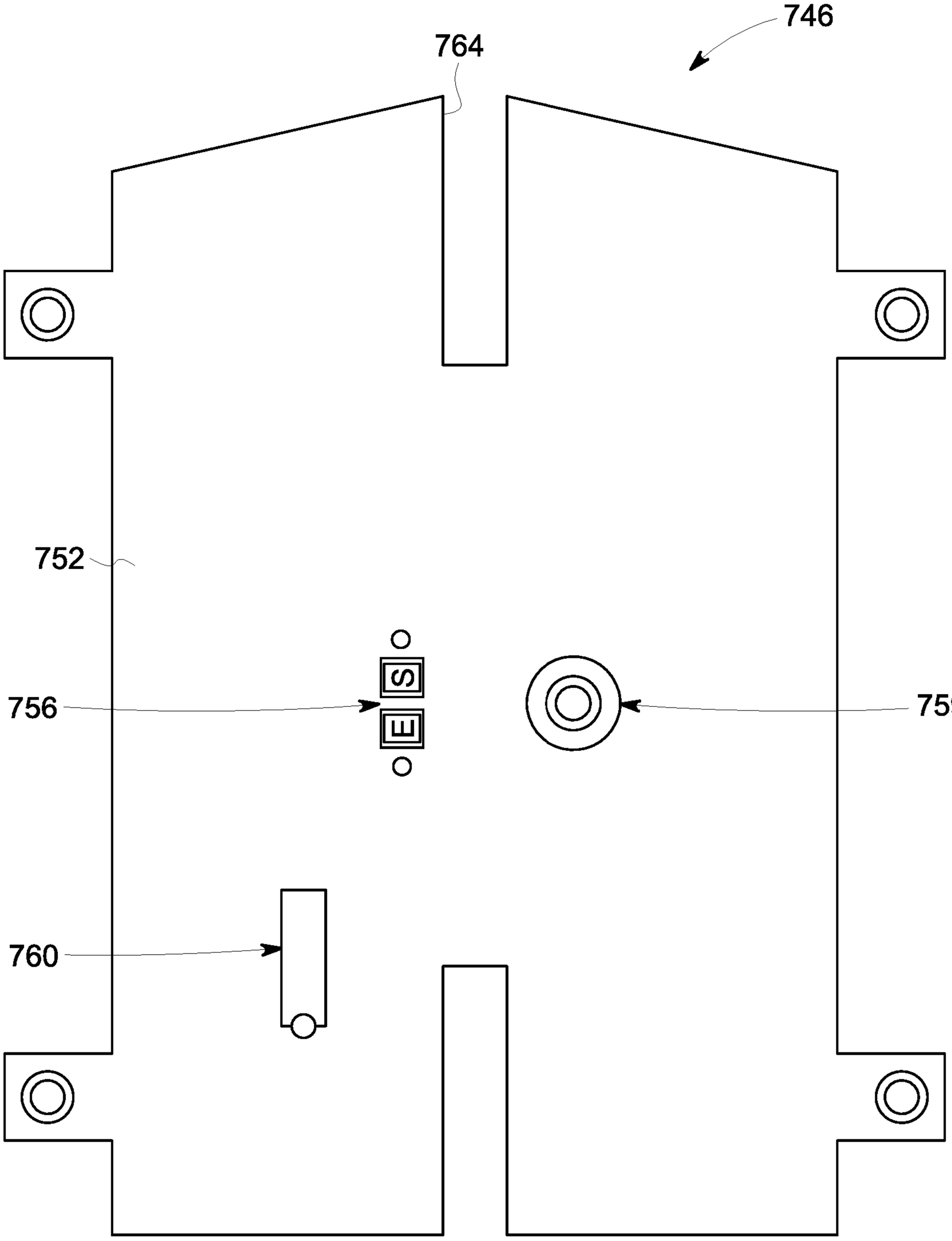


FIG. 28

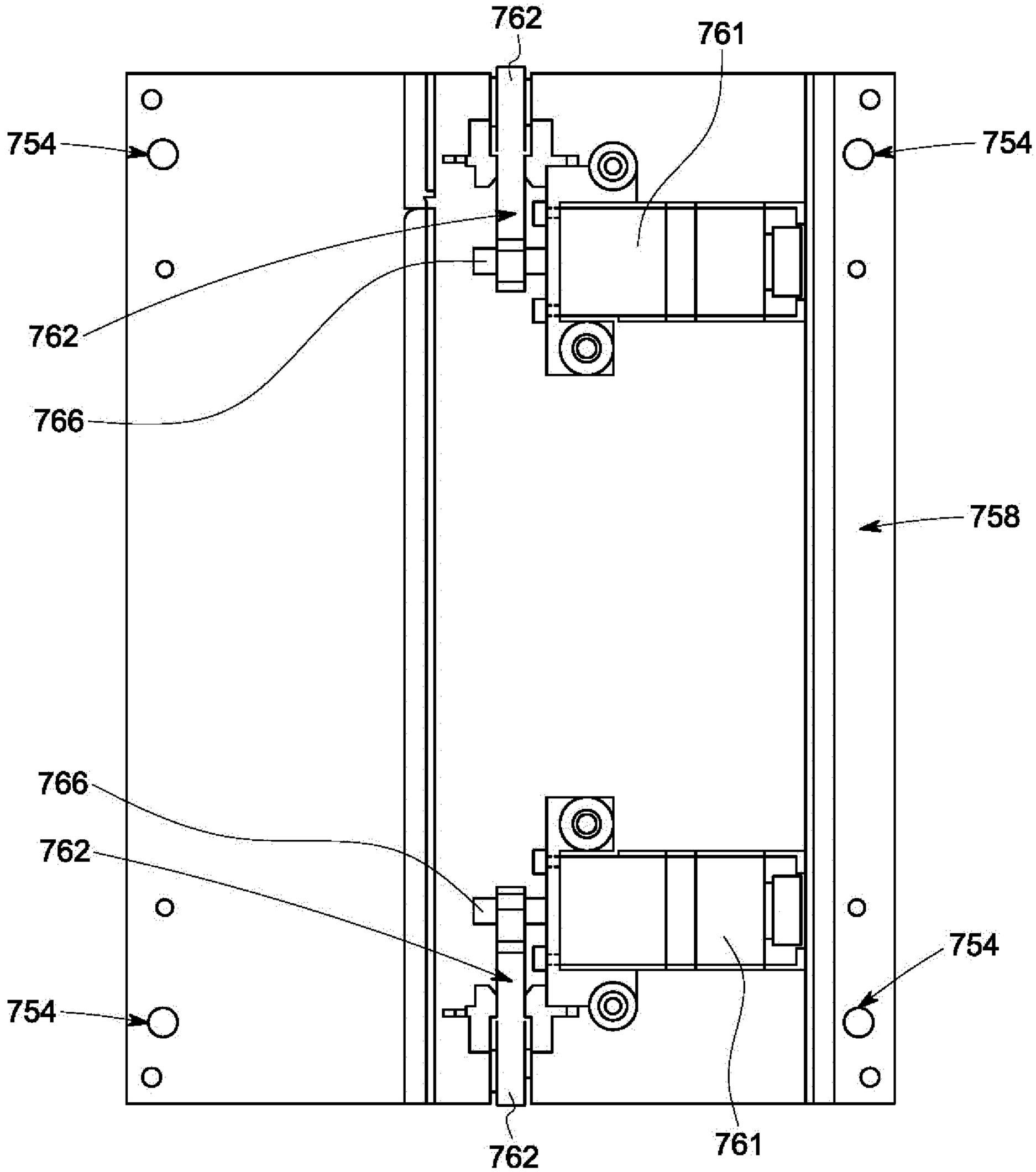


FIG. 28A

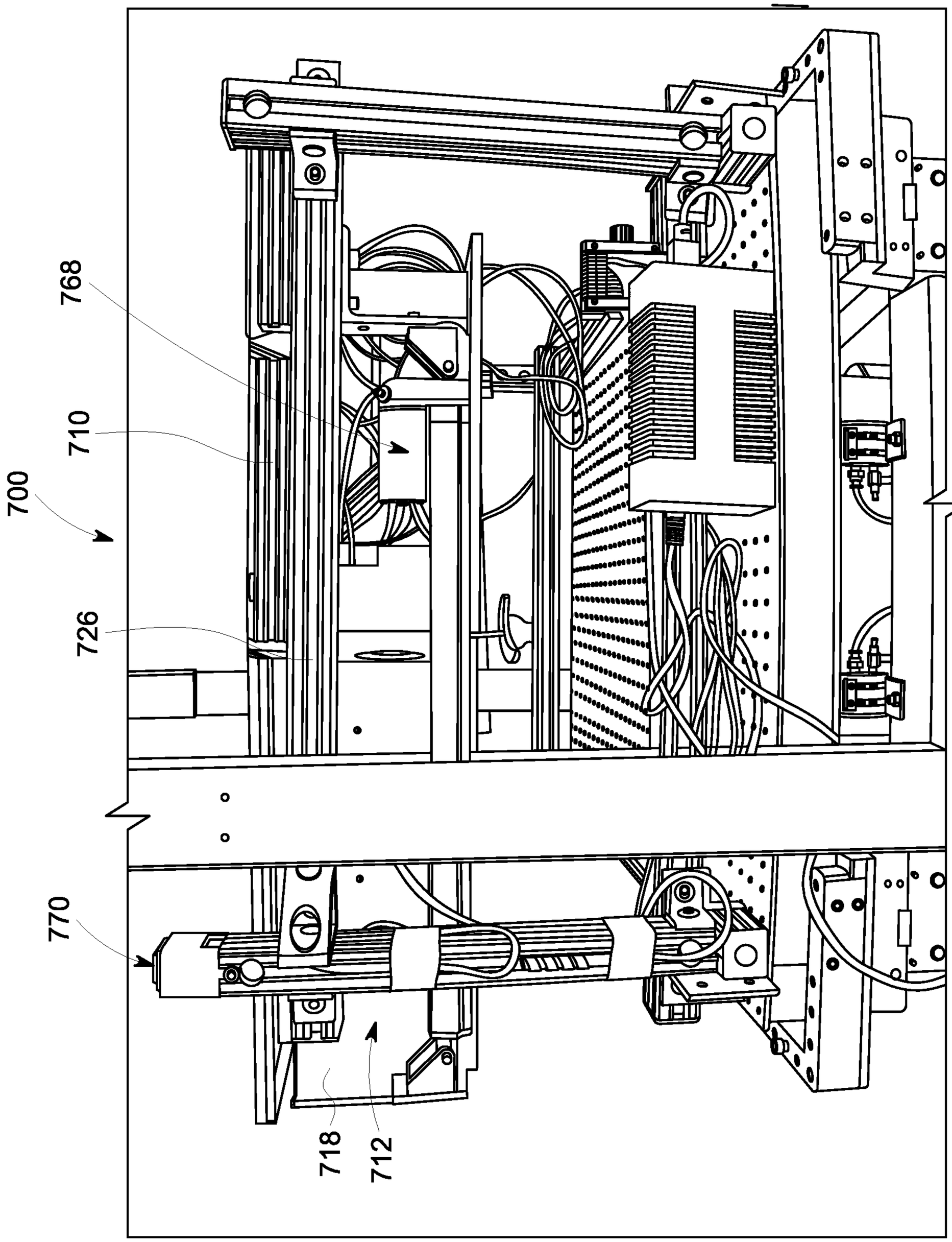


FIG. 29

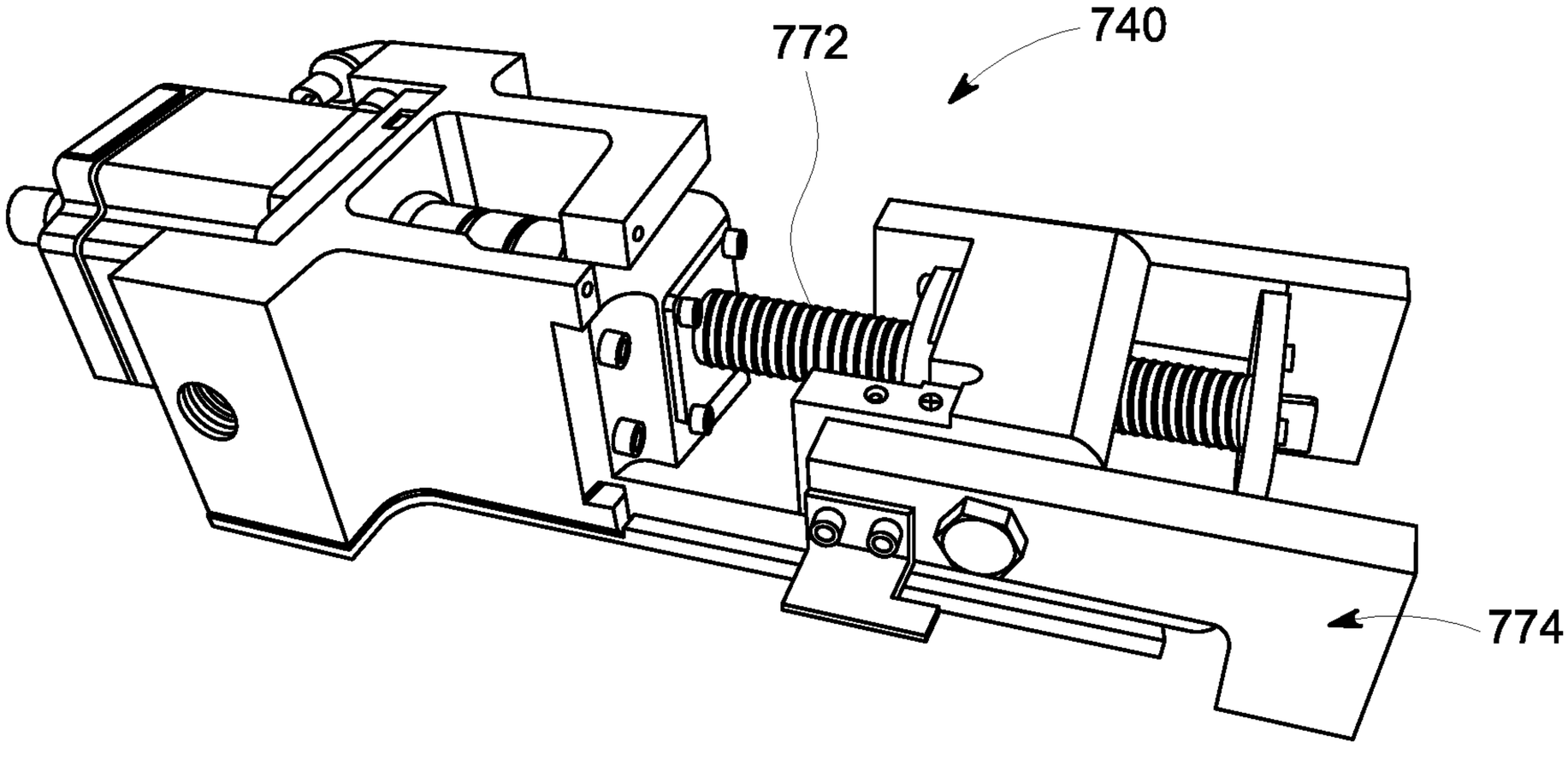


FIG. 30

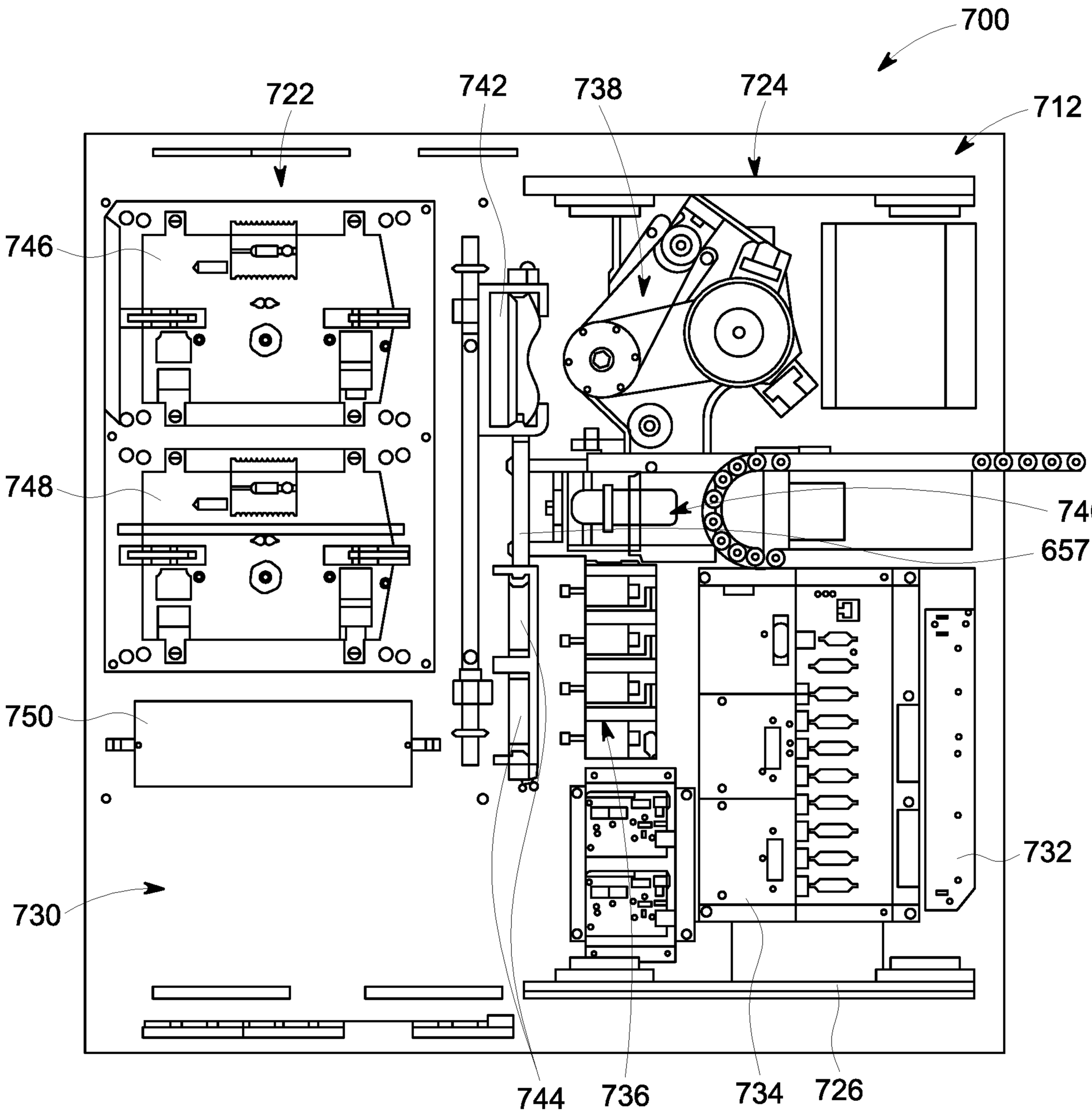

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FIG. 31

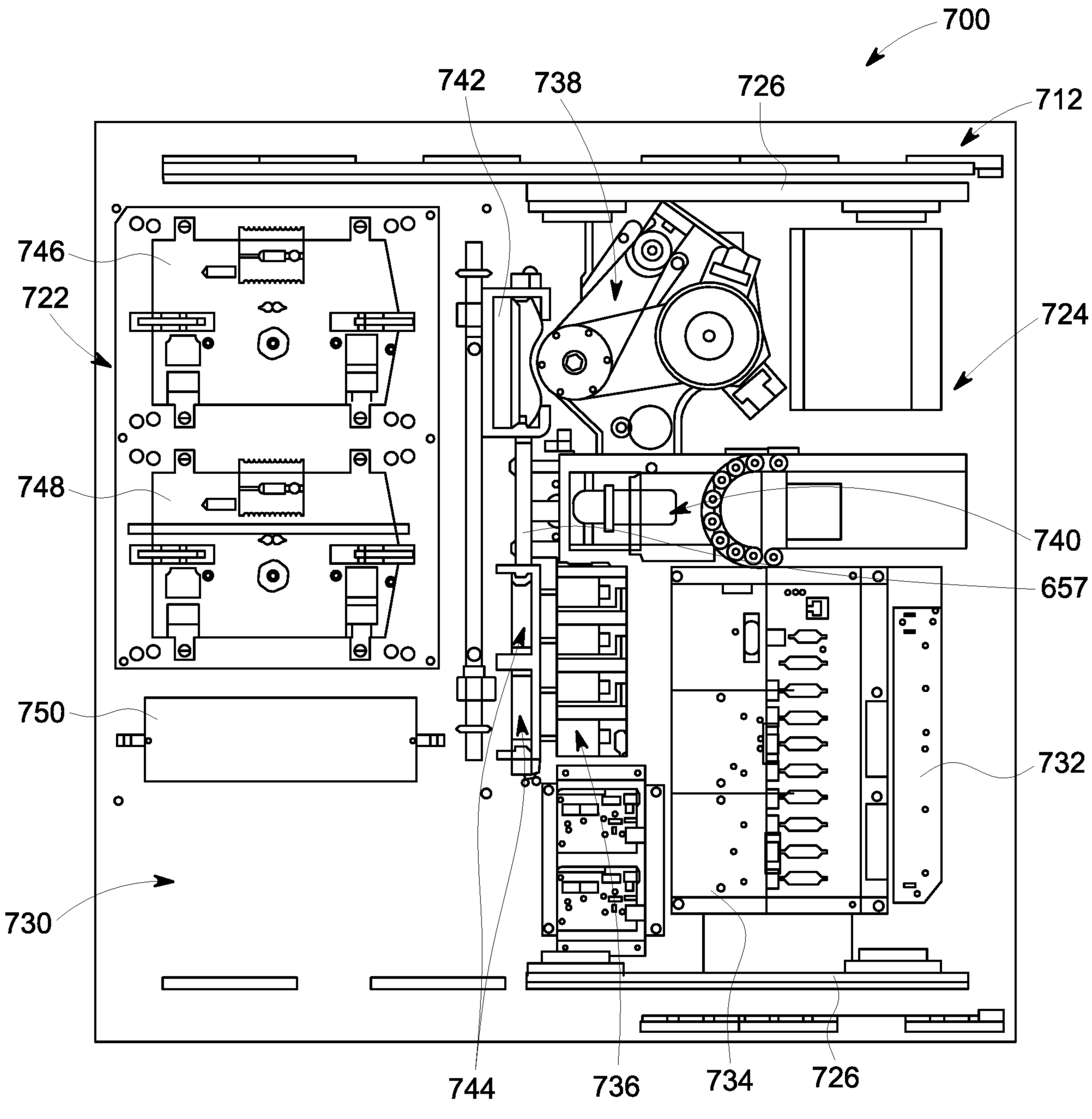

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FIG. 32

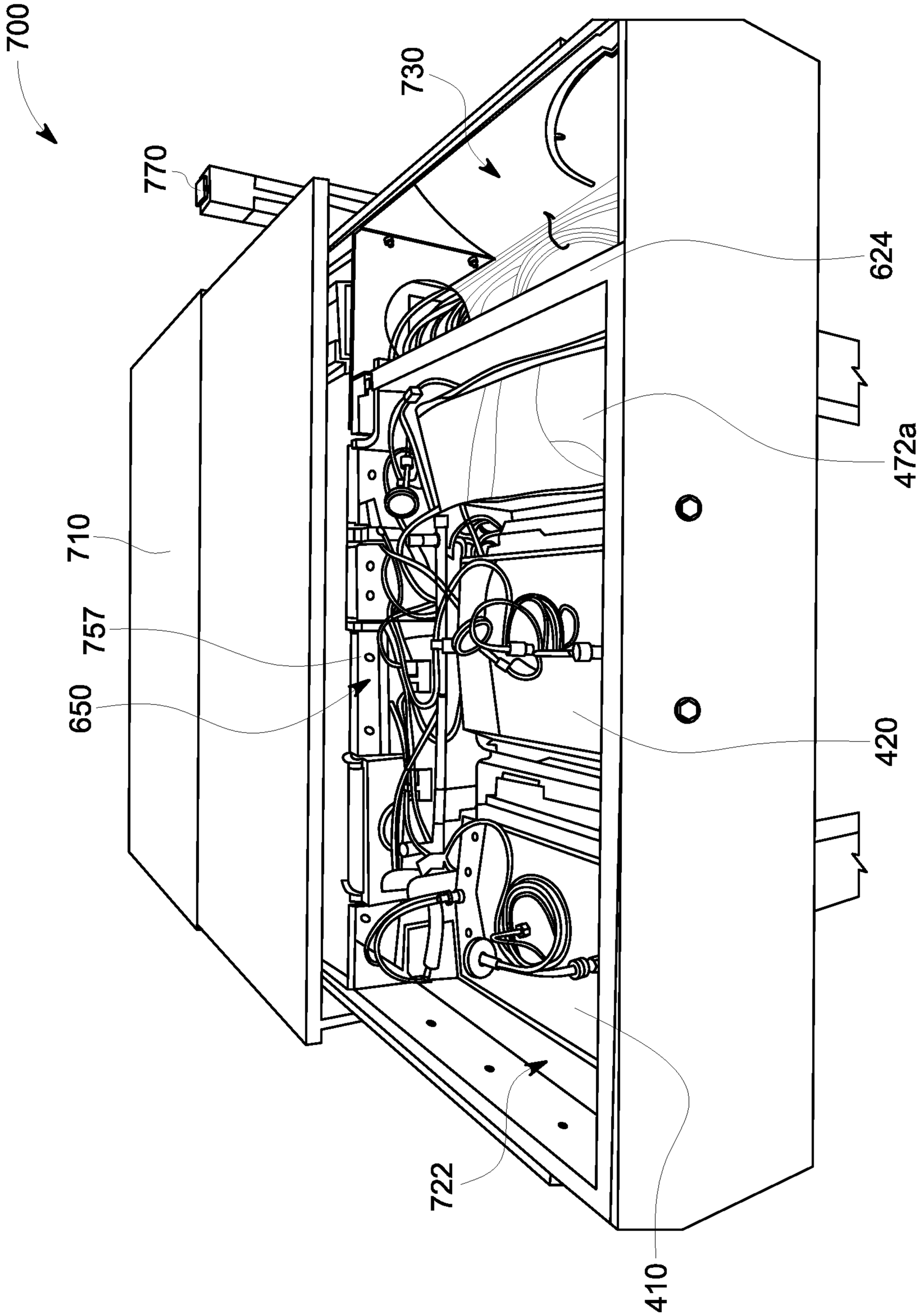


FIG. 33

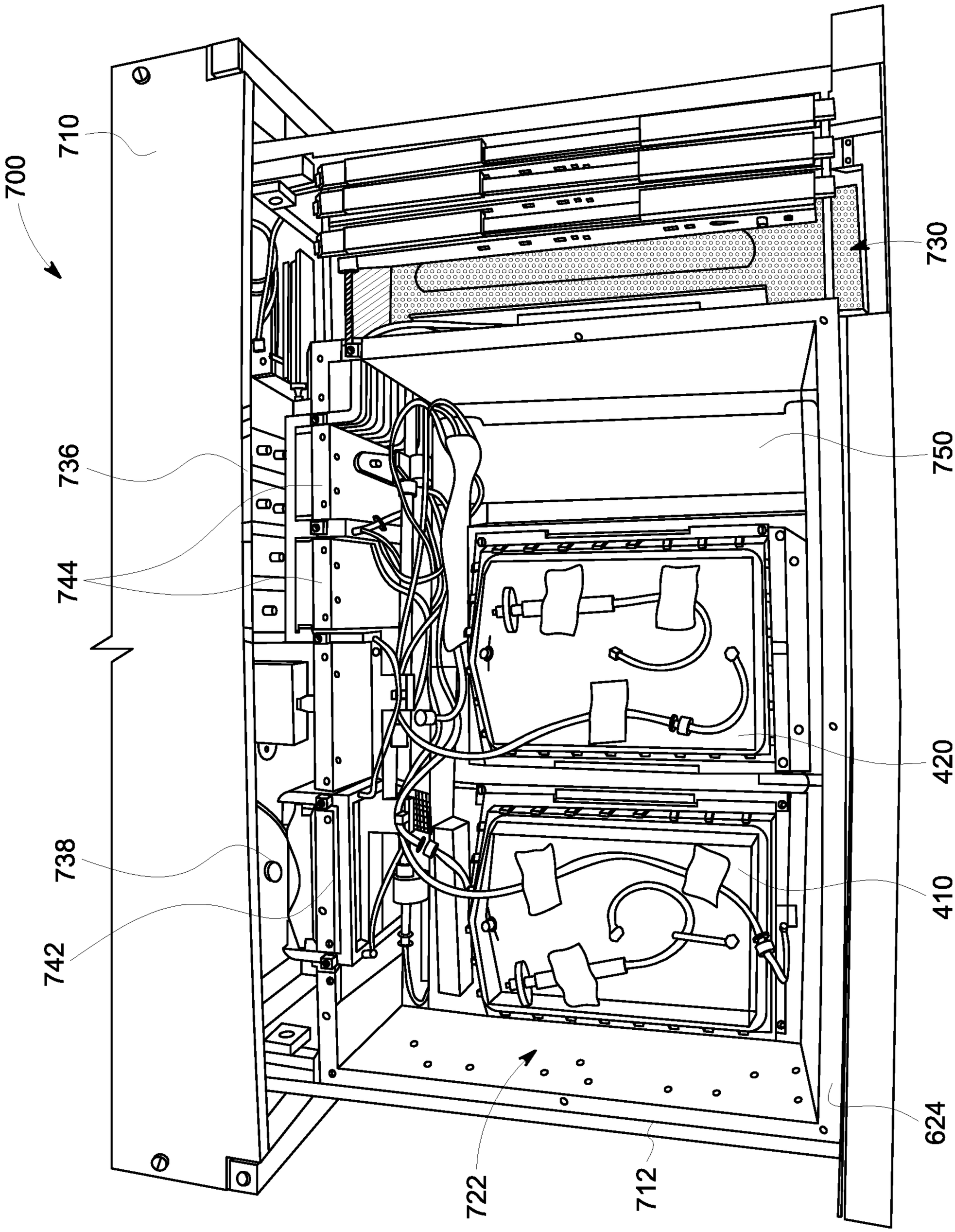


FIG. 34

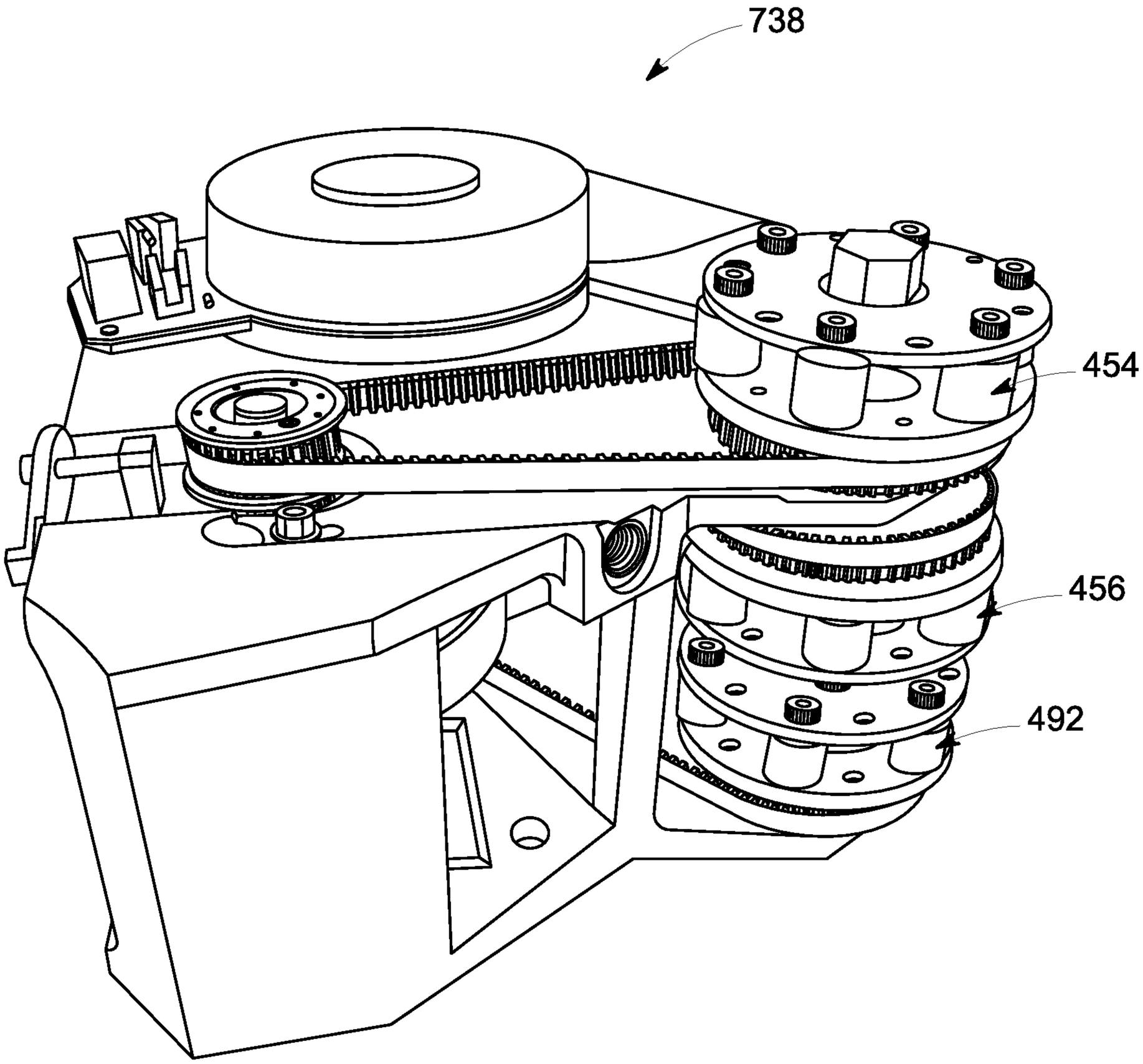


FIG. 35

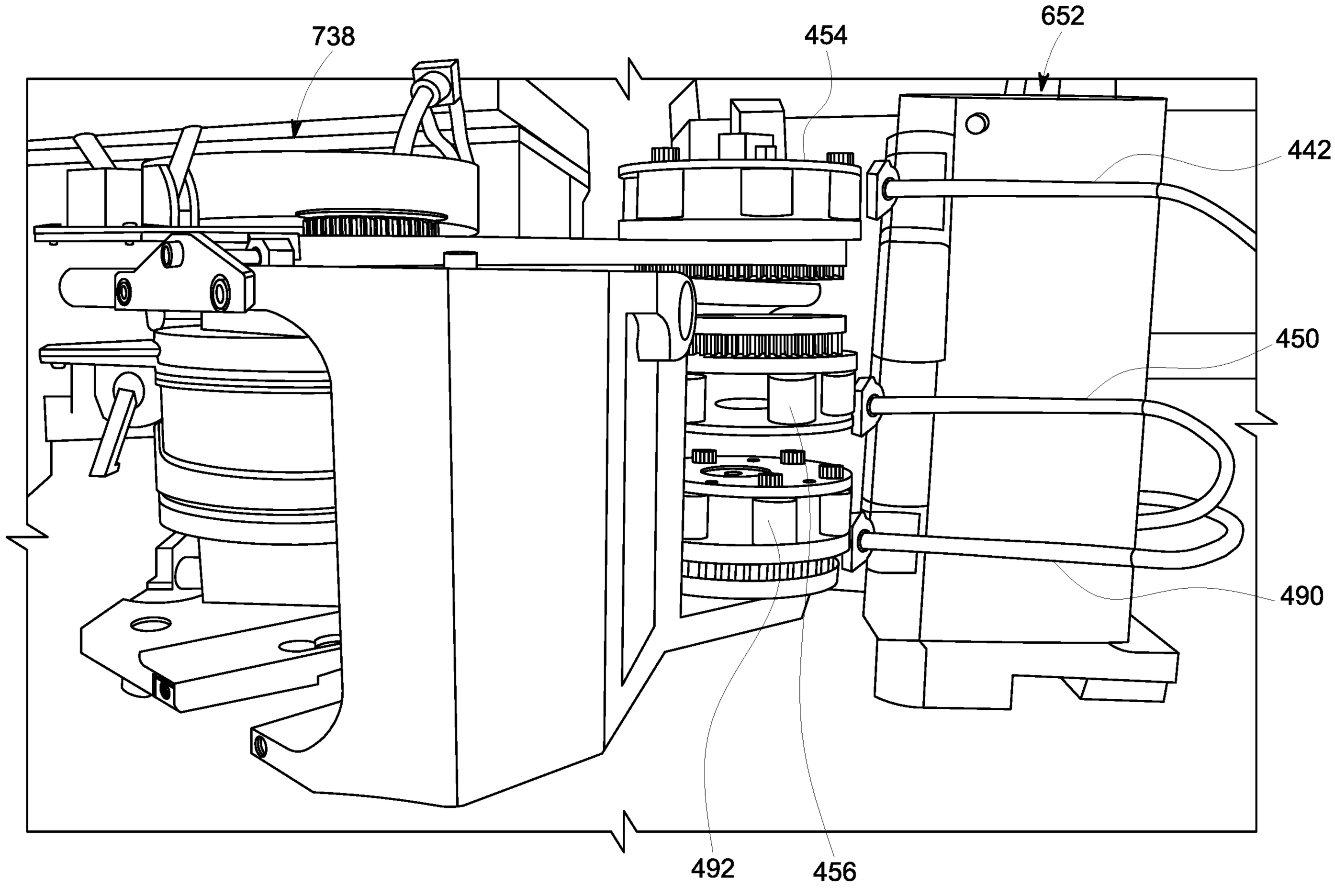


FIG. 36

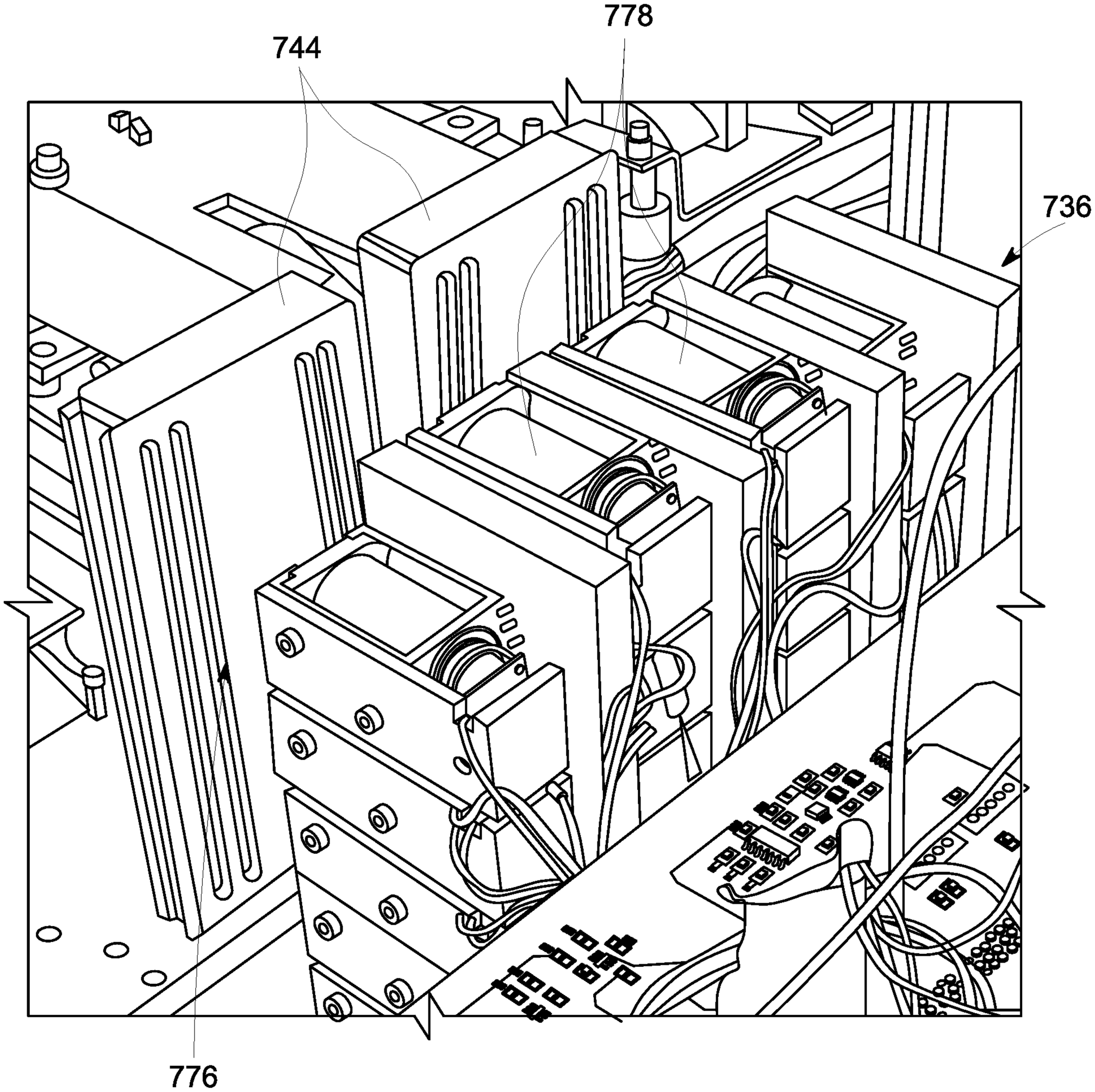


FIG. 37

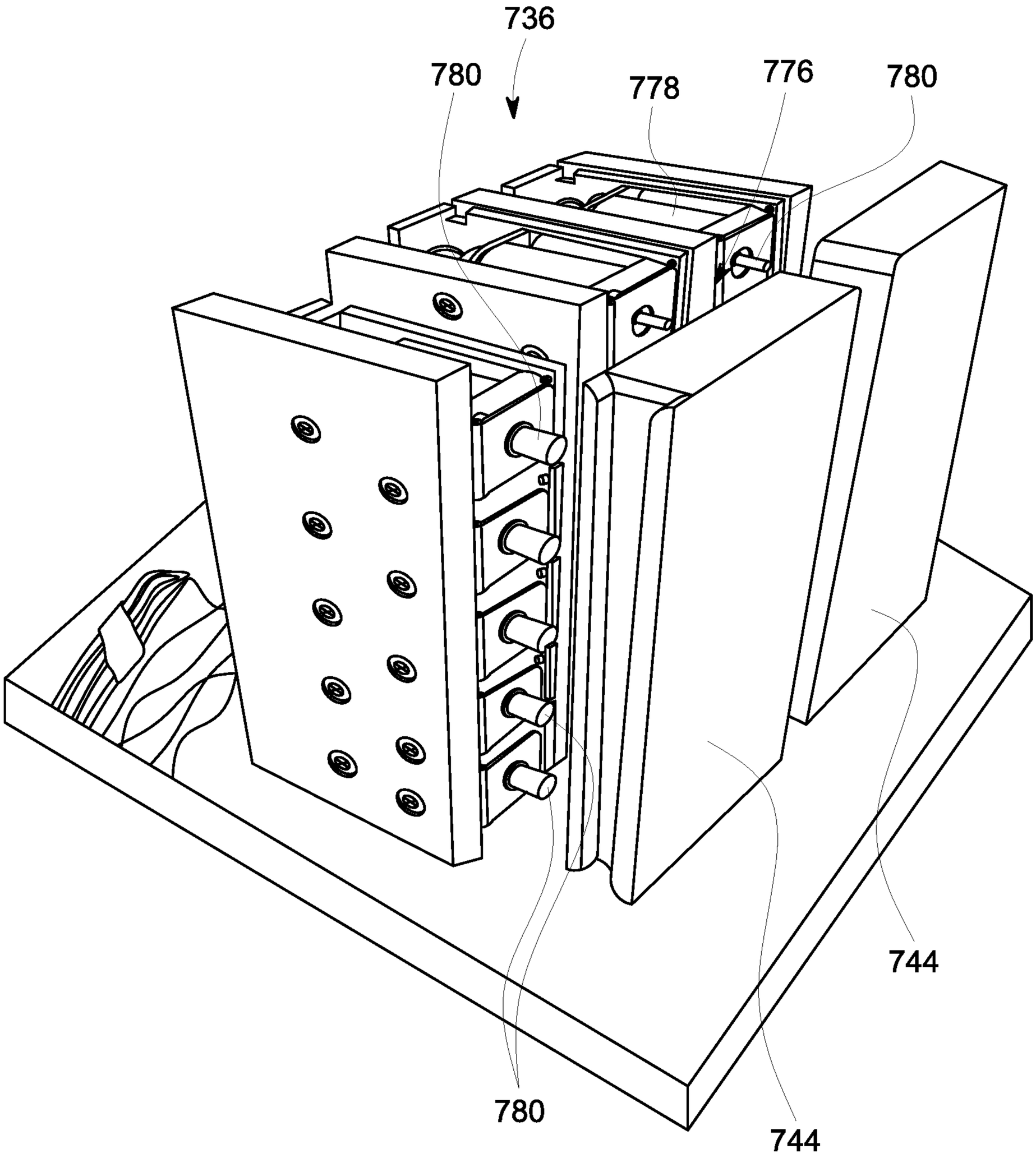


FIG. 38

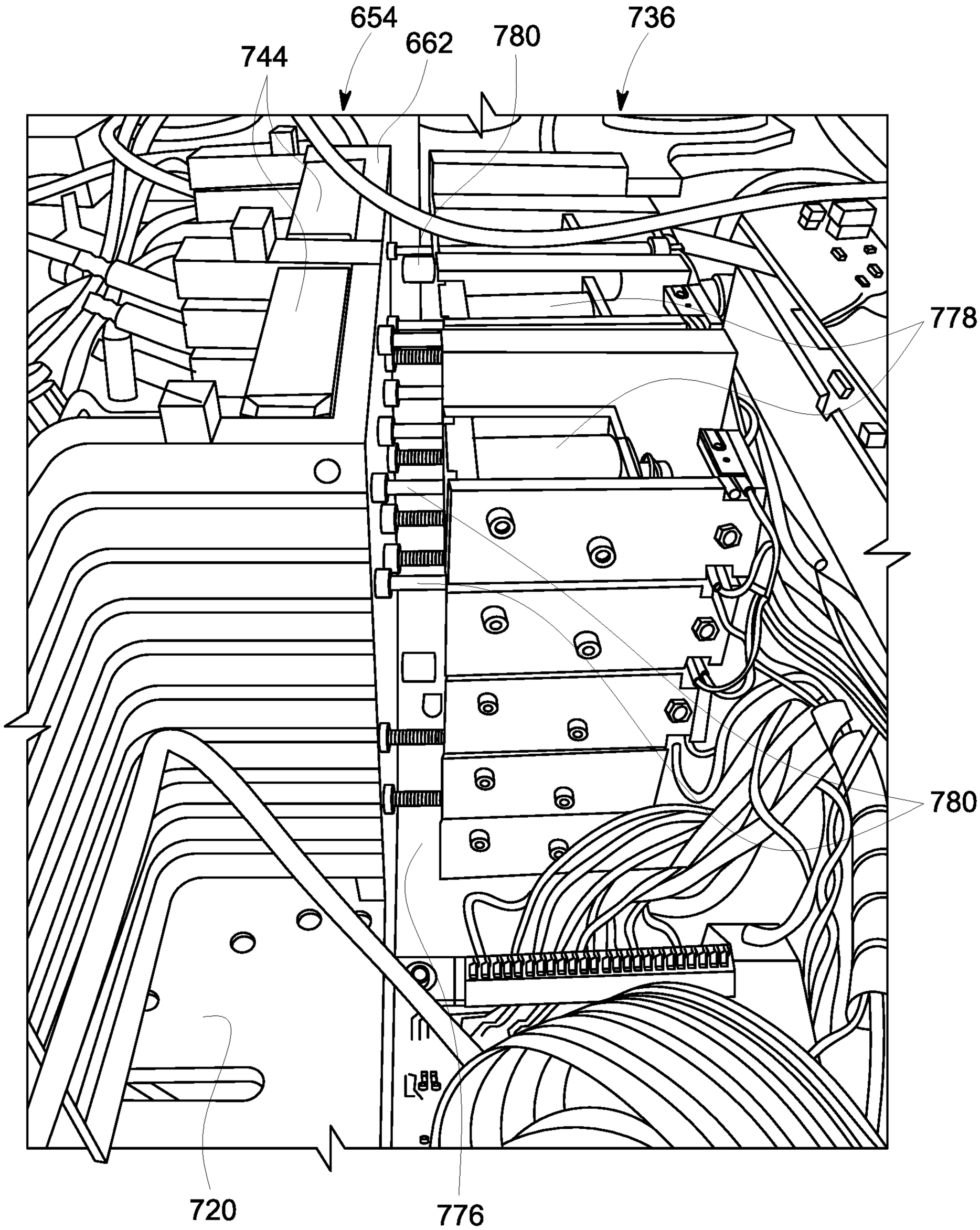


FIG. 39

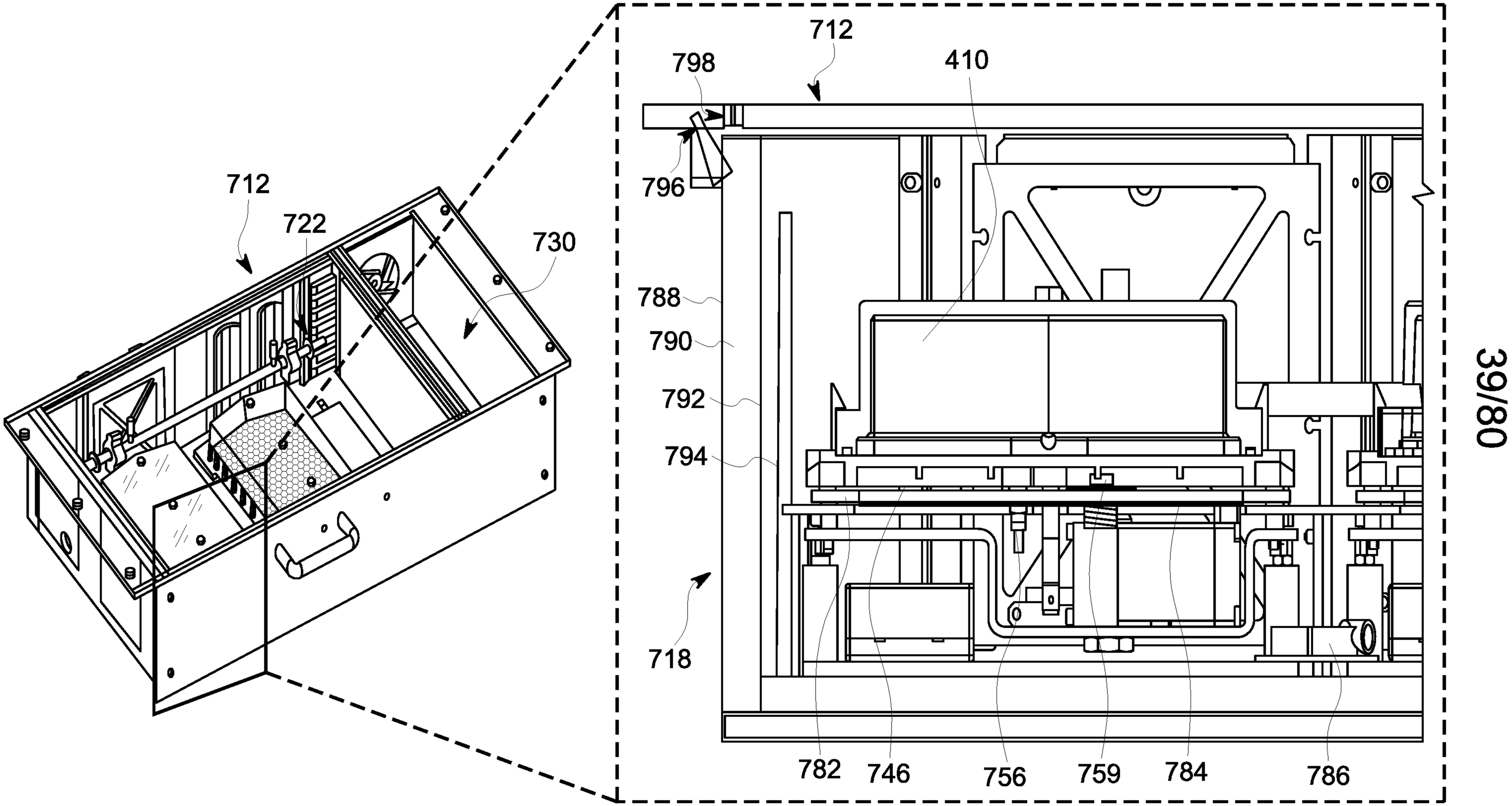

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FIG. 40

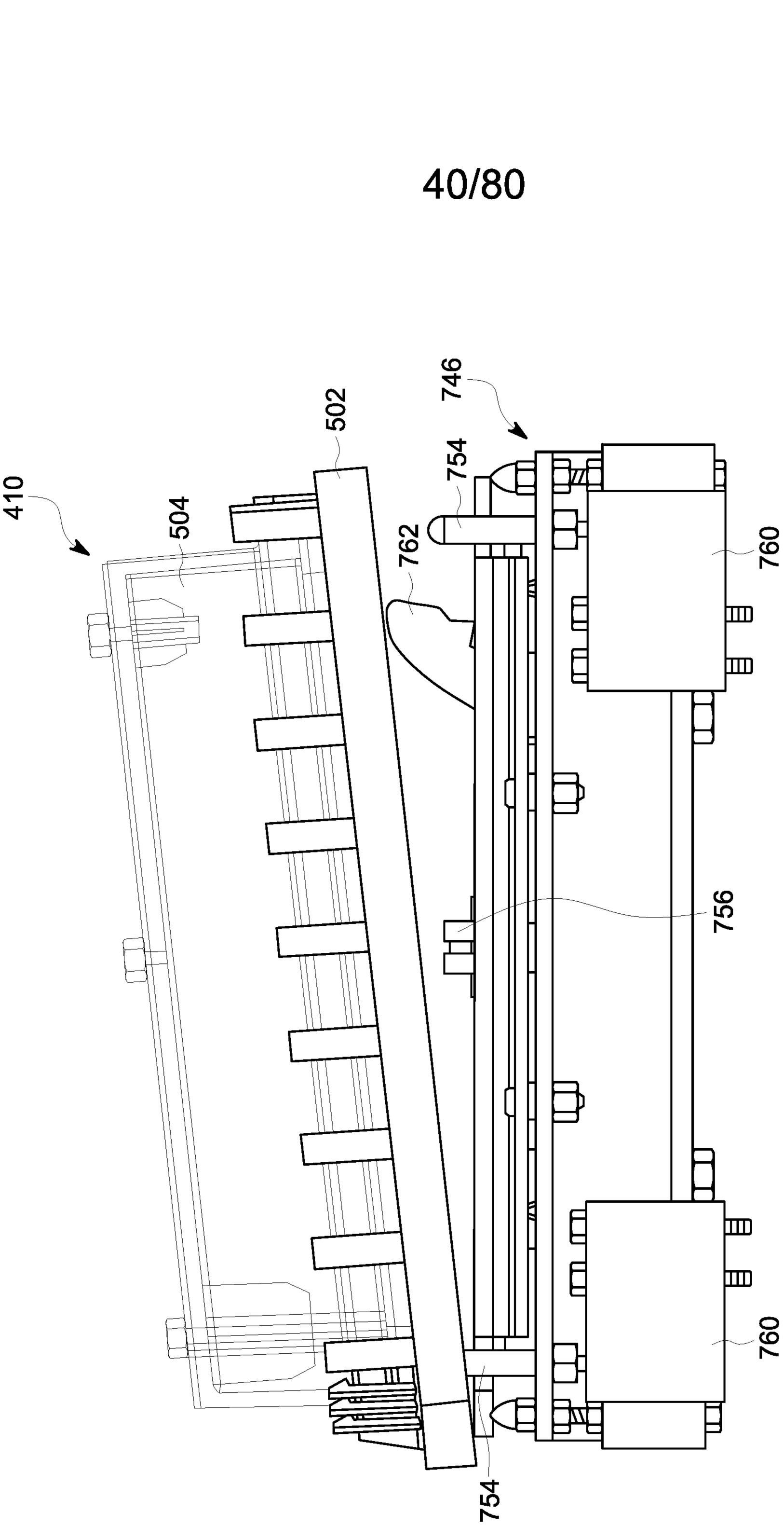


FIG. 41

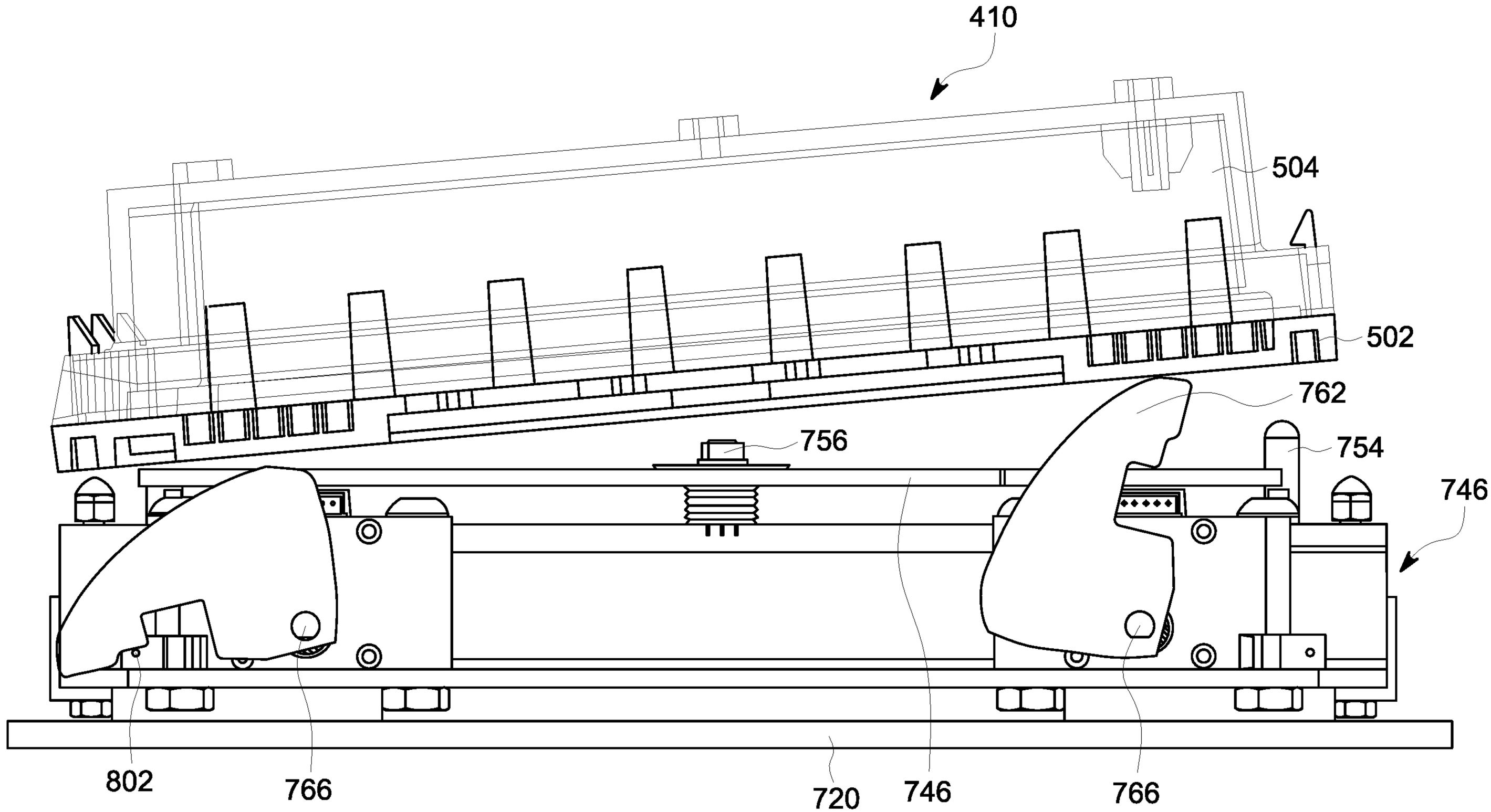


FIG. 42

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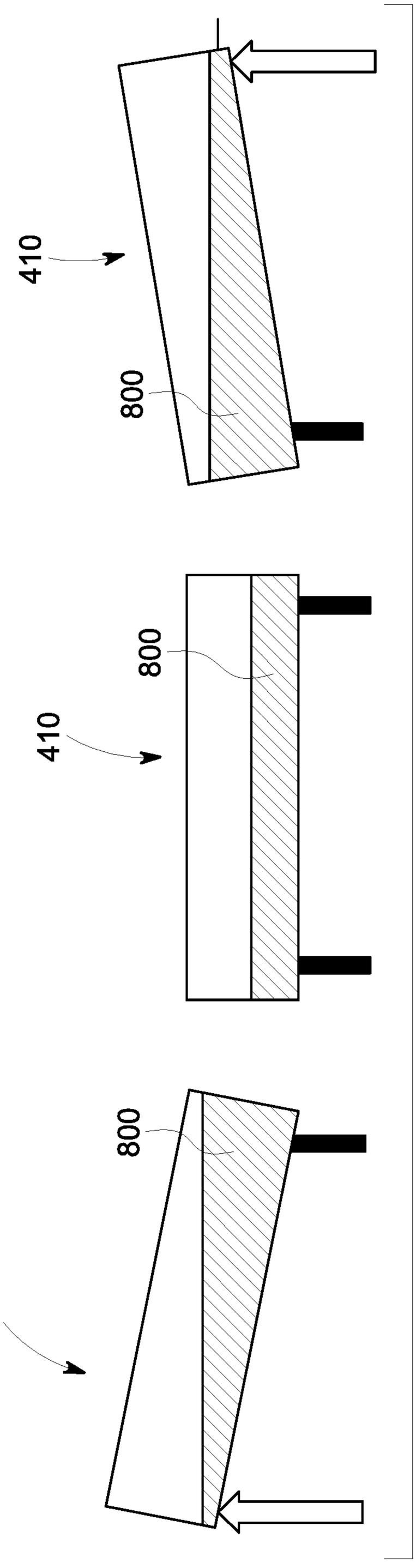


FIG. 43

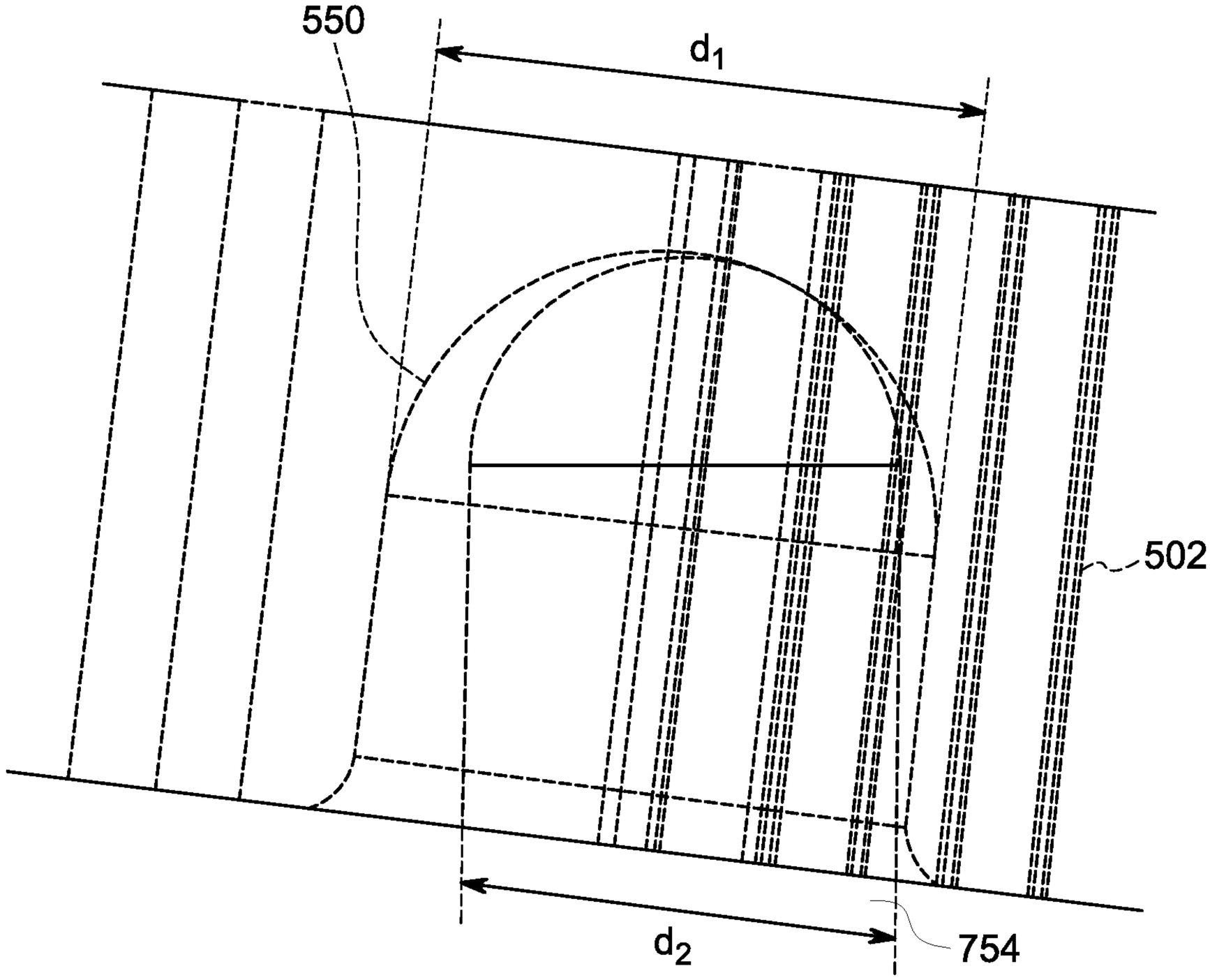


FIG. 44

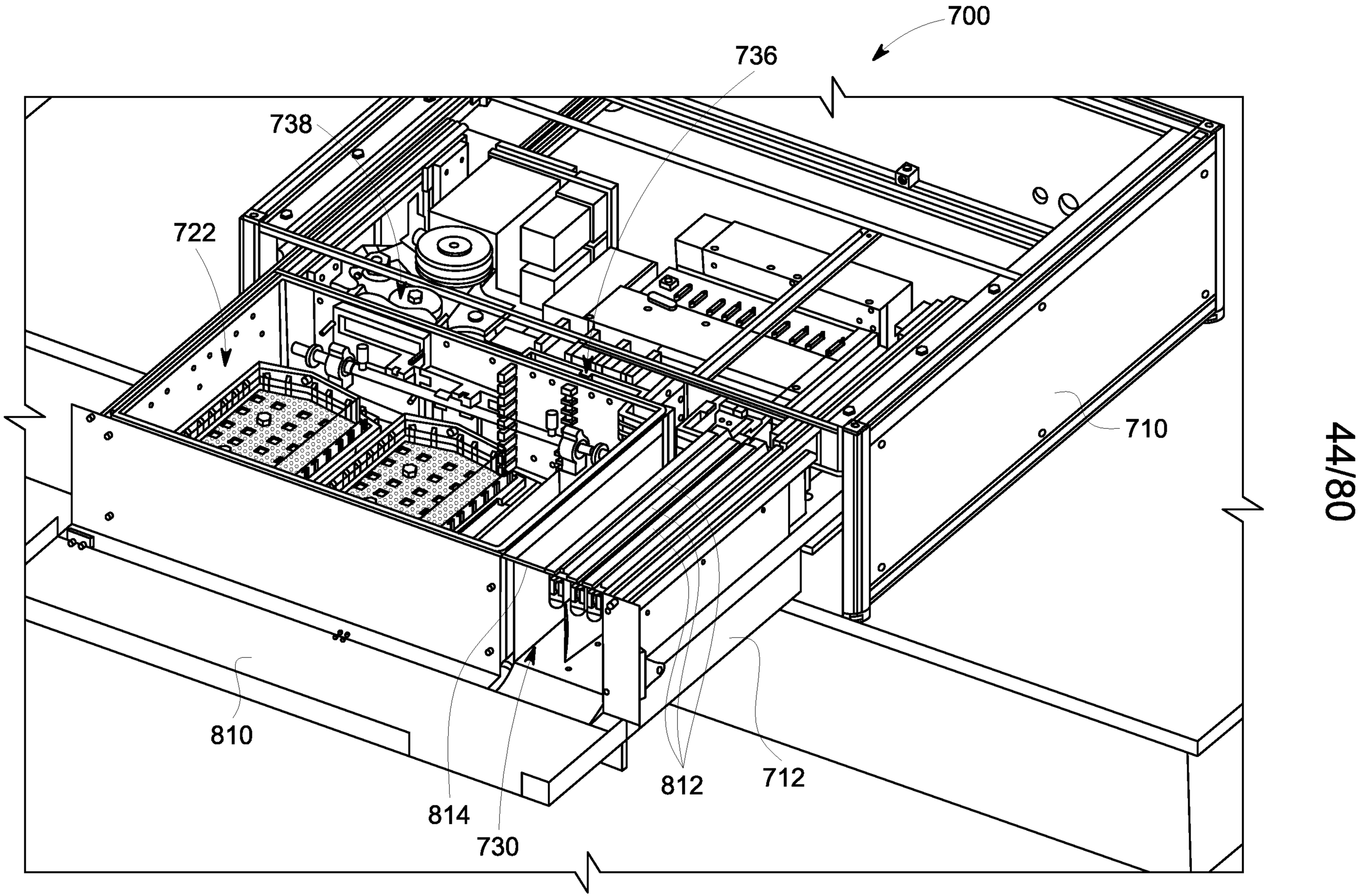


FIG. 45

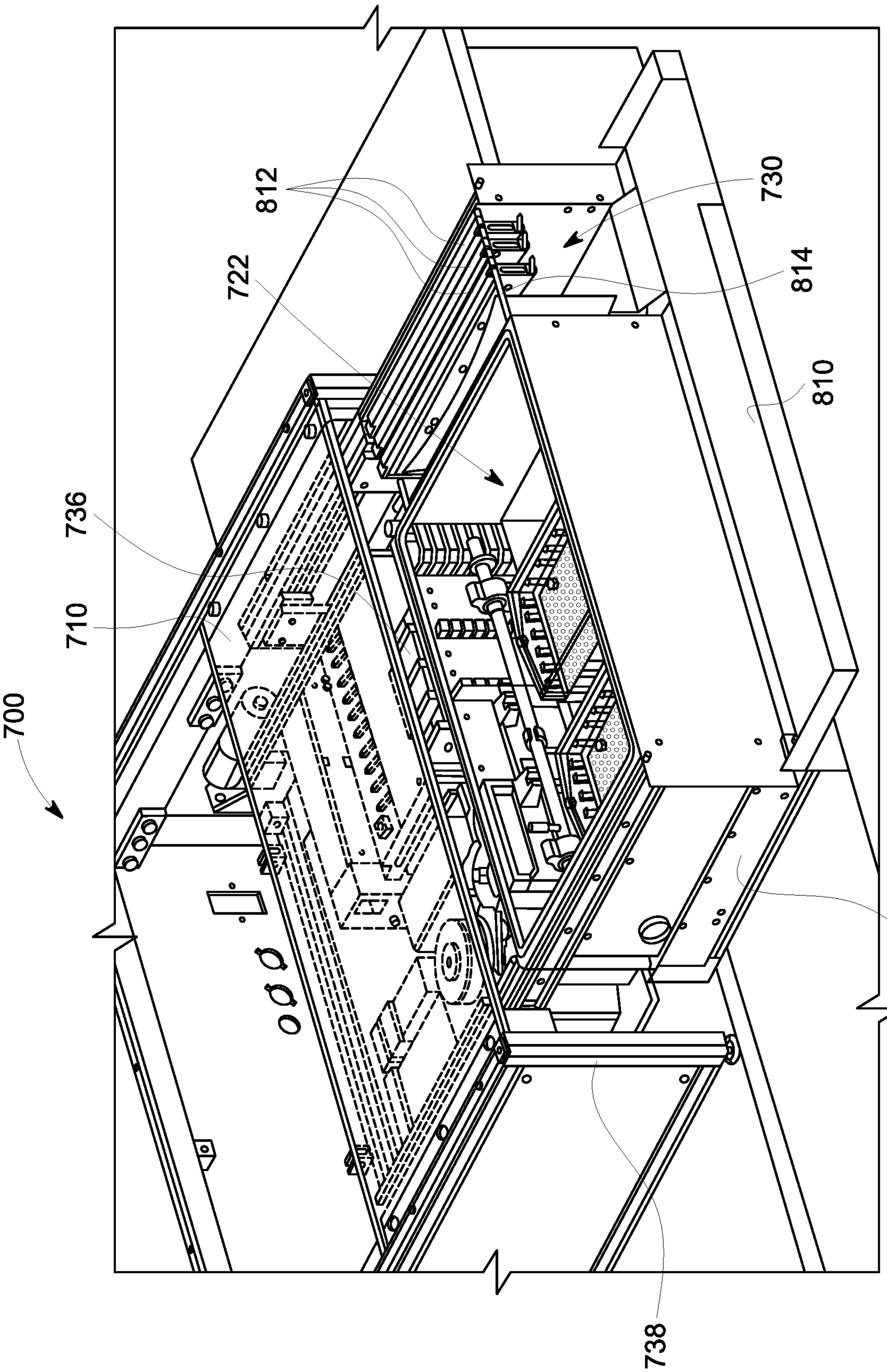


FIG. 46

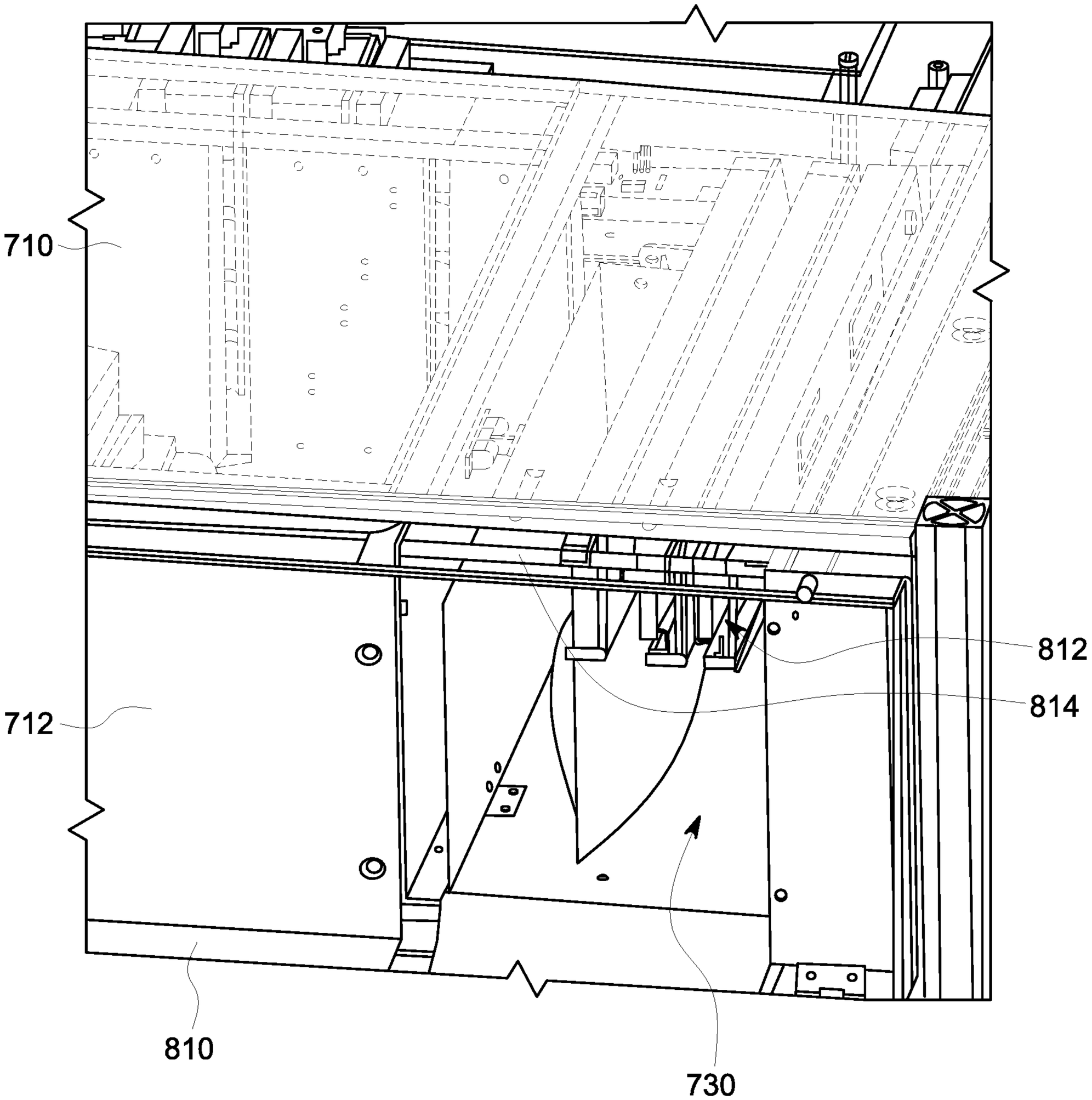


FIG. 47

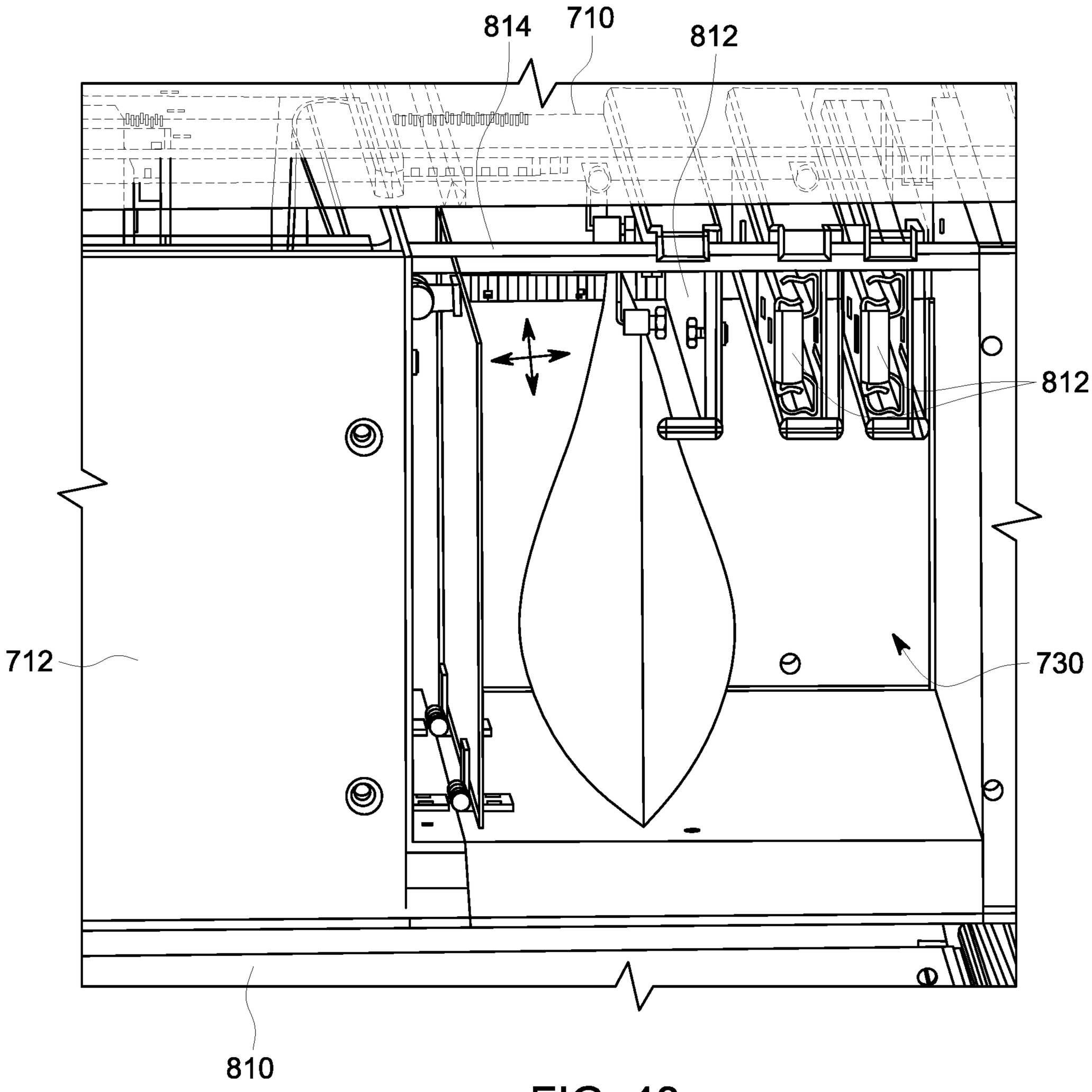


FIG. 48

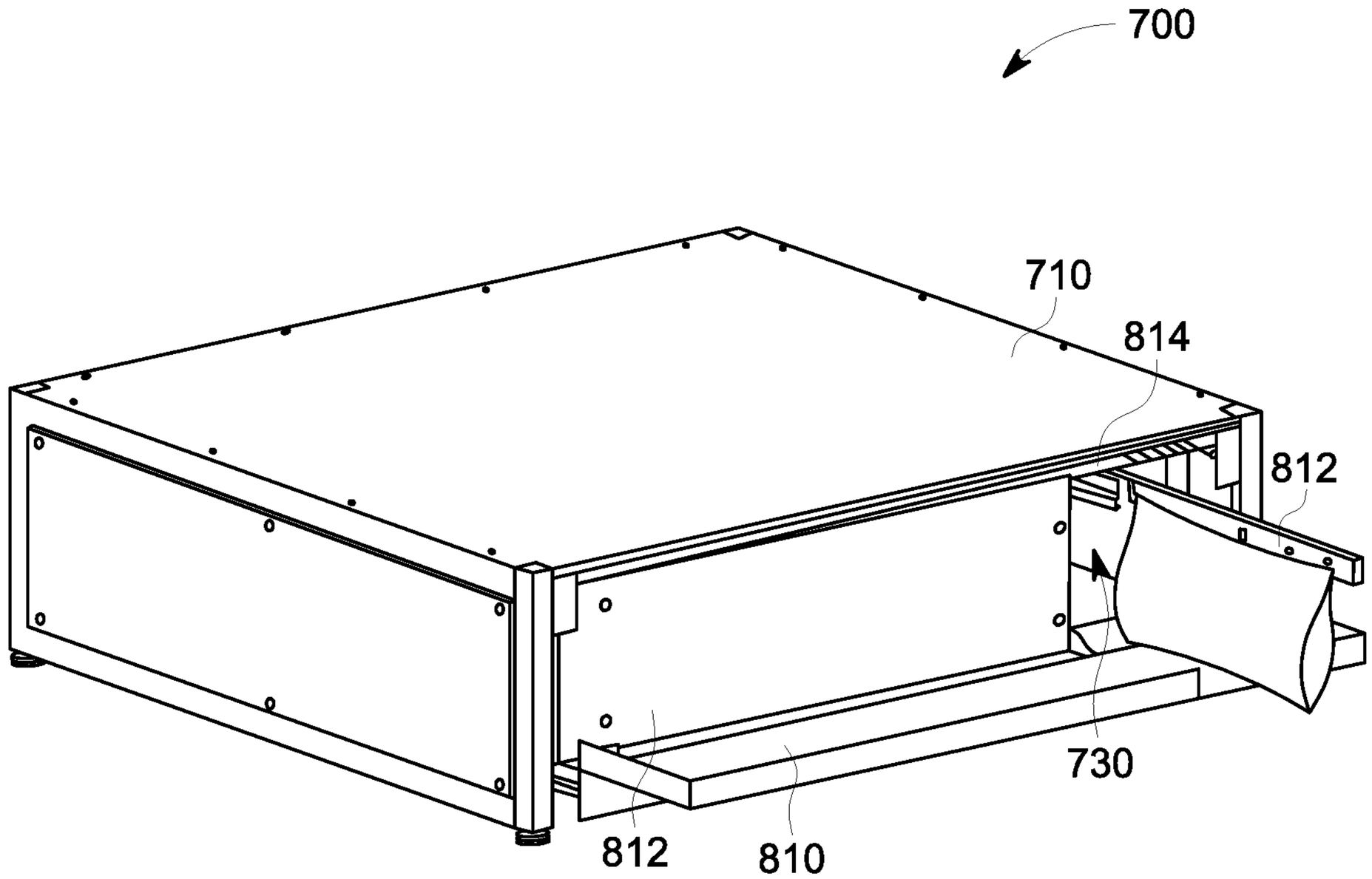


FIG. 49

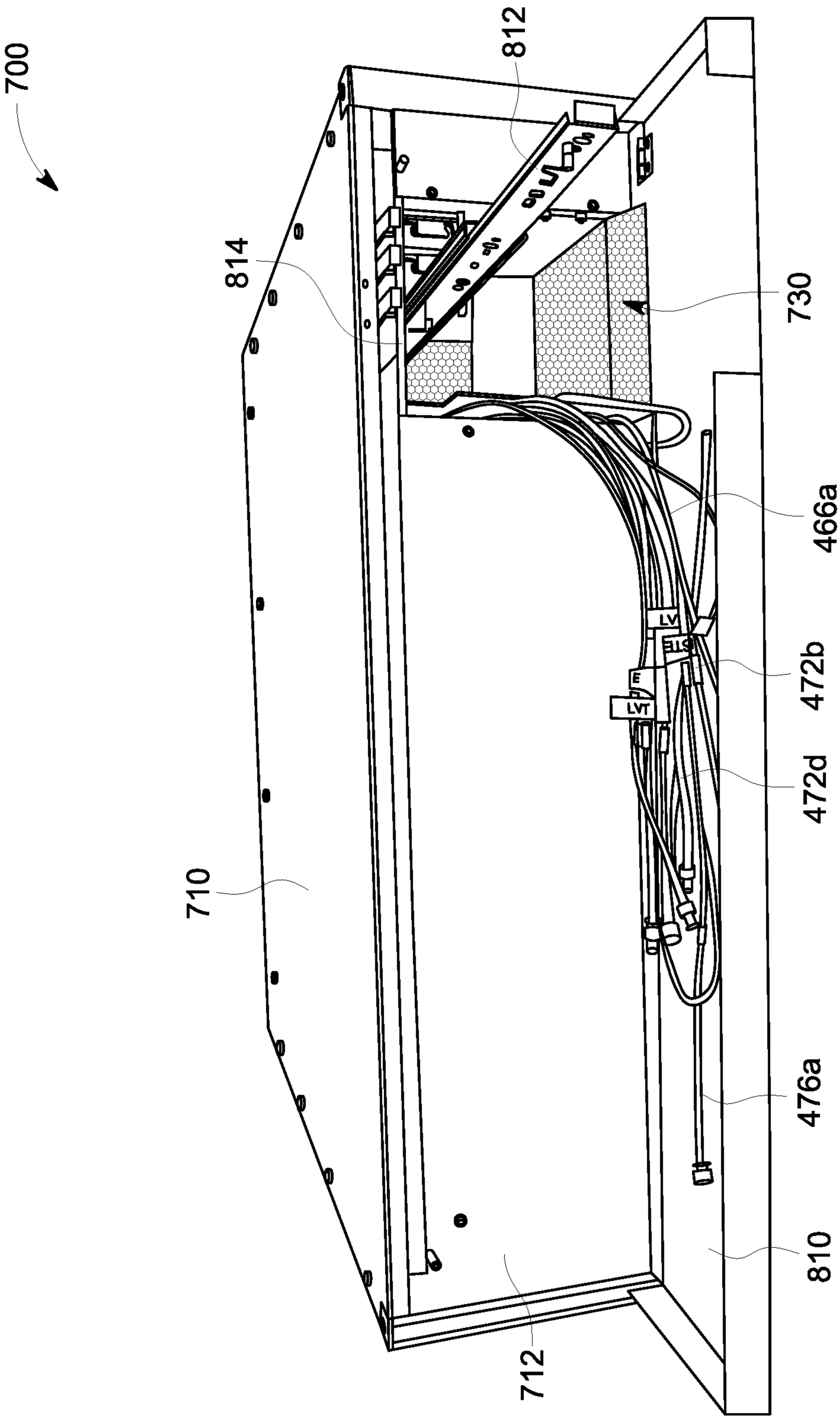


FIG. 50

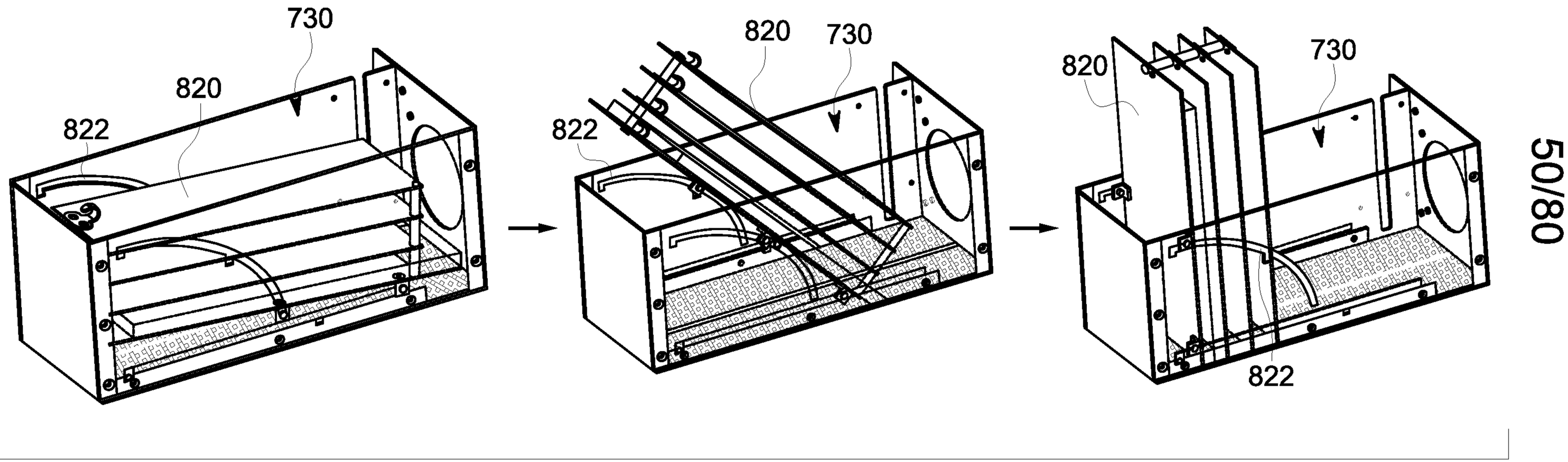


FIG. 51

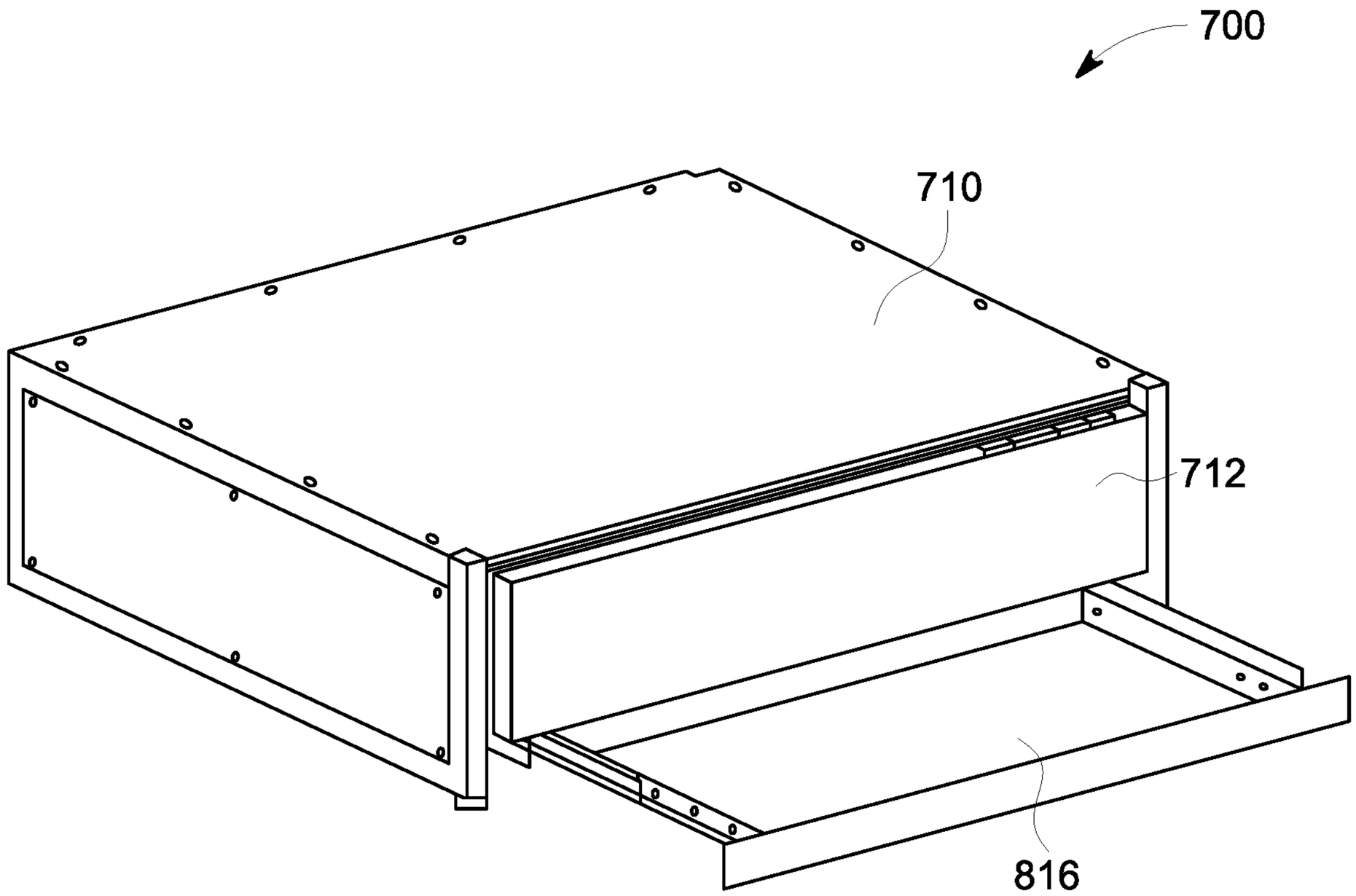


FIG. 52

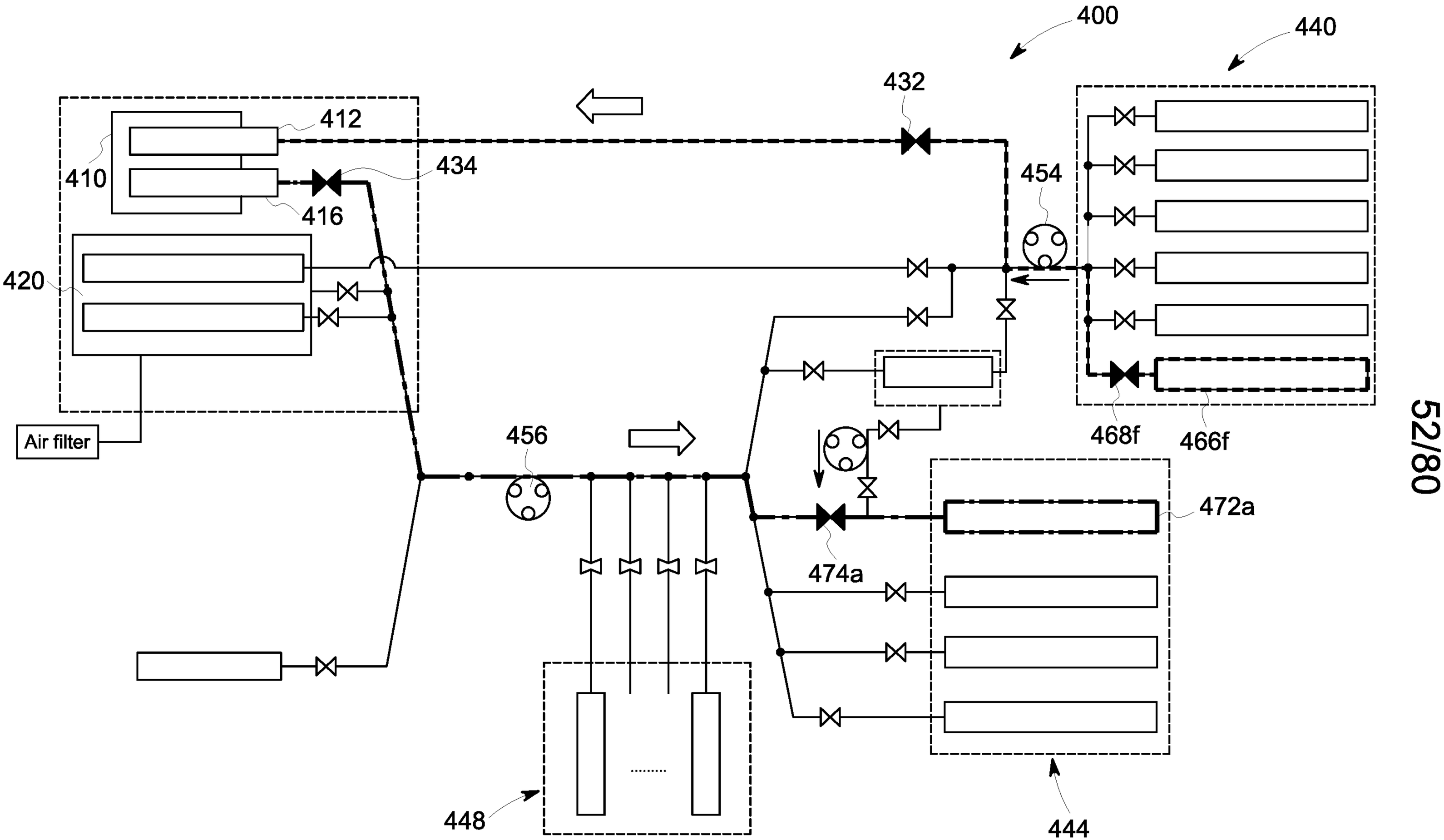

400
440
432
412
410
434
416
454
420
Air filter
456
468f
466f
472a
474a
448
444

FIG. 53

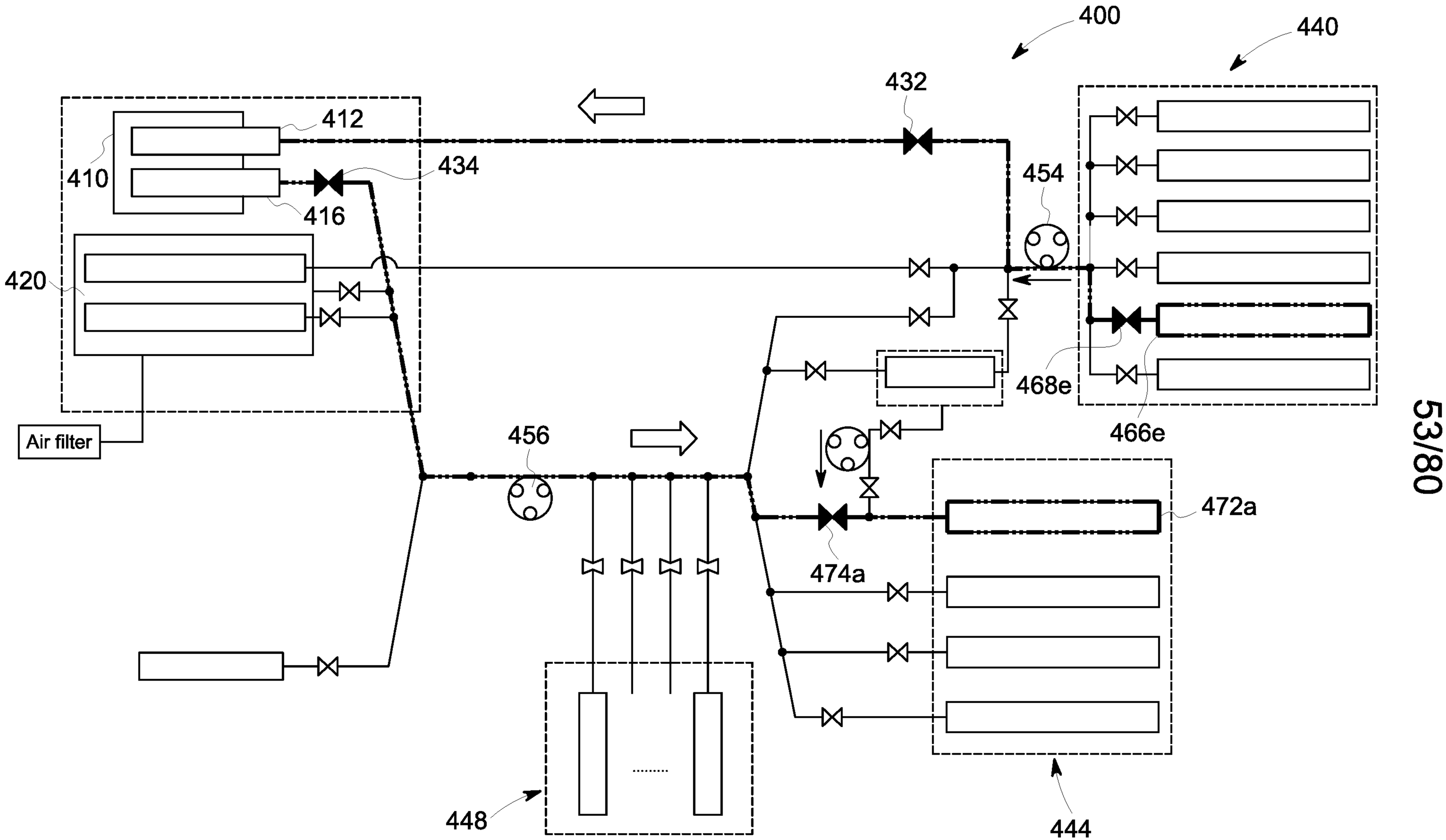

400
440
432
412
410
434
416
454
420
468e
466e
Air filter
456
472a
474a
448
444

FIG. 54

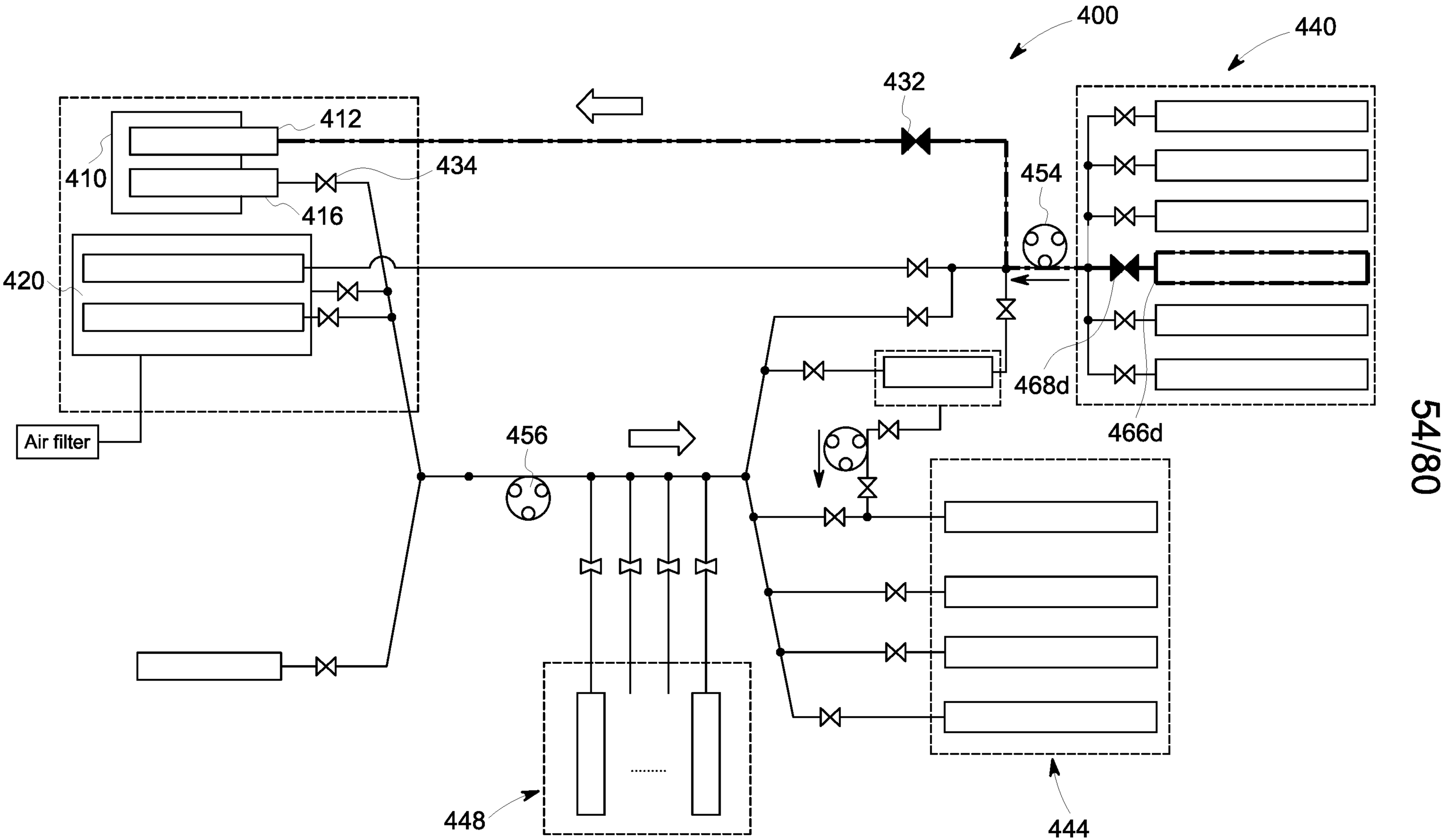

400
440
432
412
410
434
416
454
420
468d
466d
Air filter
456
448
444

FIG. 55

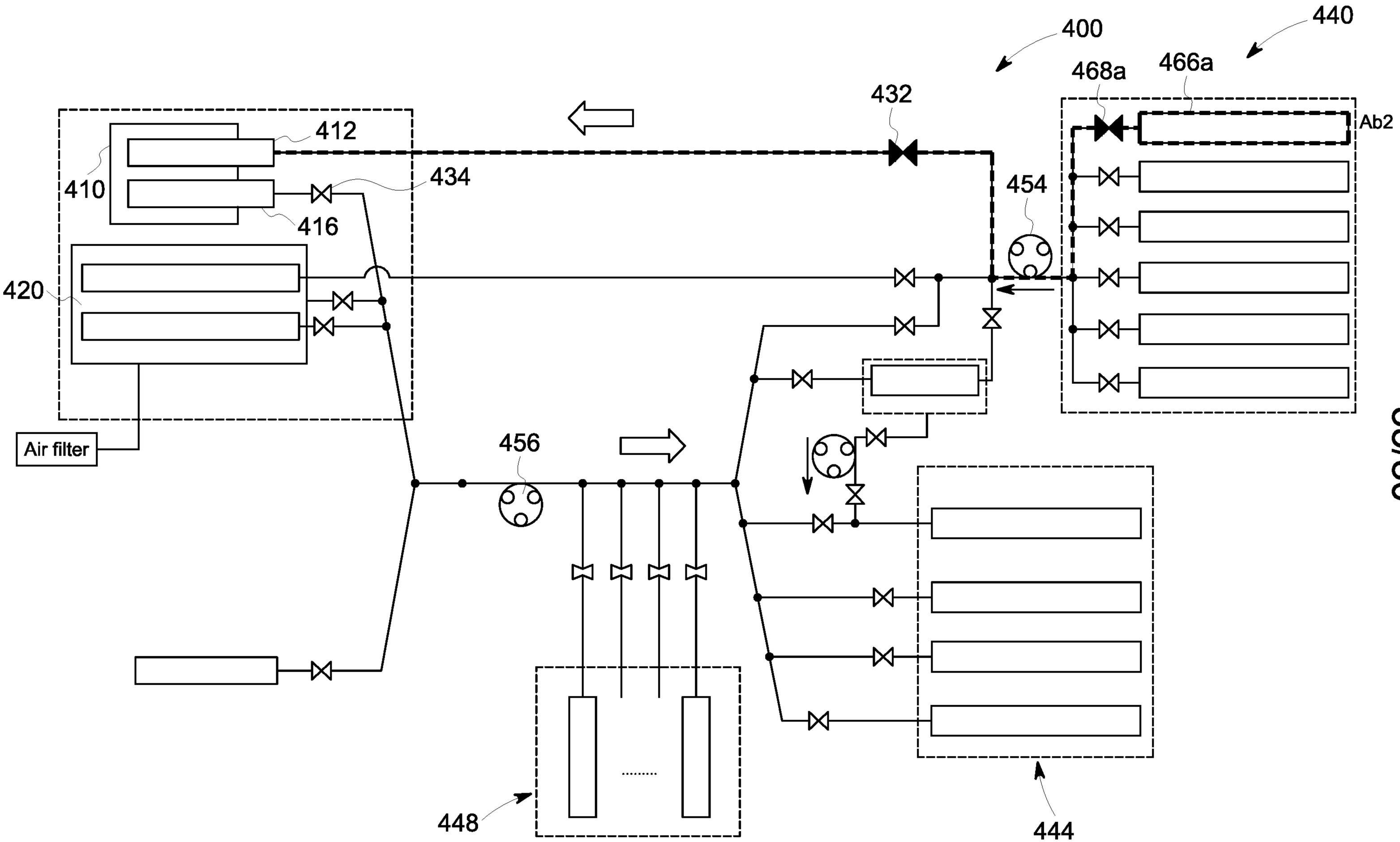

400
440
468a
466a
Ab2
432
412
410
434
416
454
420
Air filter
456
448
444

FIG. 56

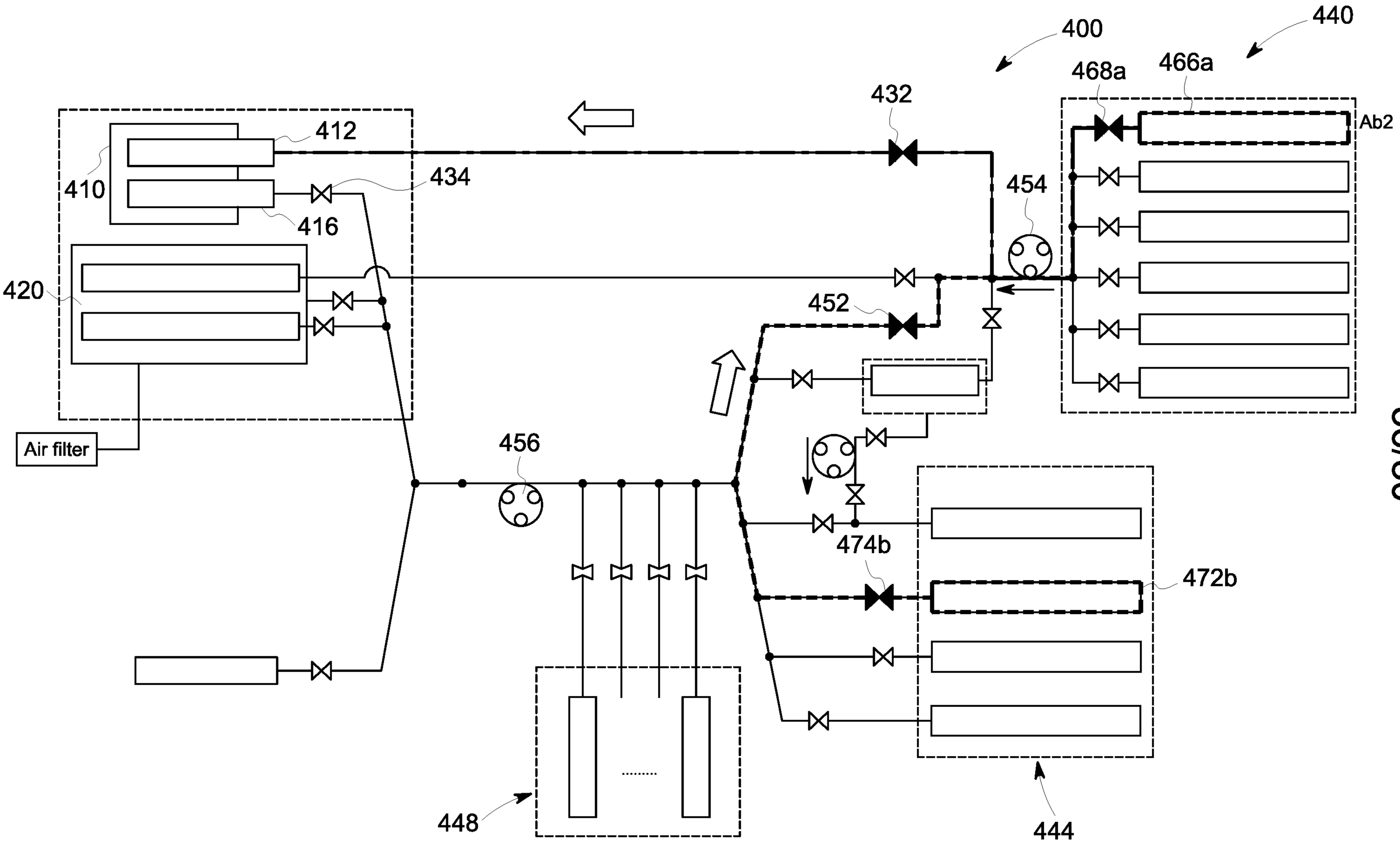

400
440
468a
466a
Ab2
432
412
410
434
416
454
420
452
Air filter
456
474b
472b
448
444

FIG. 57

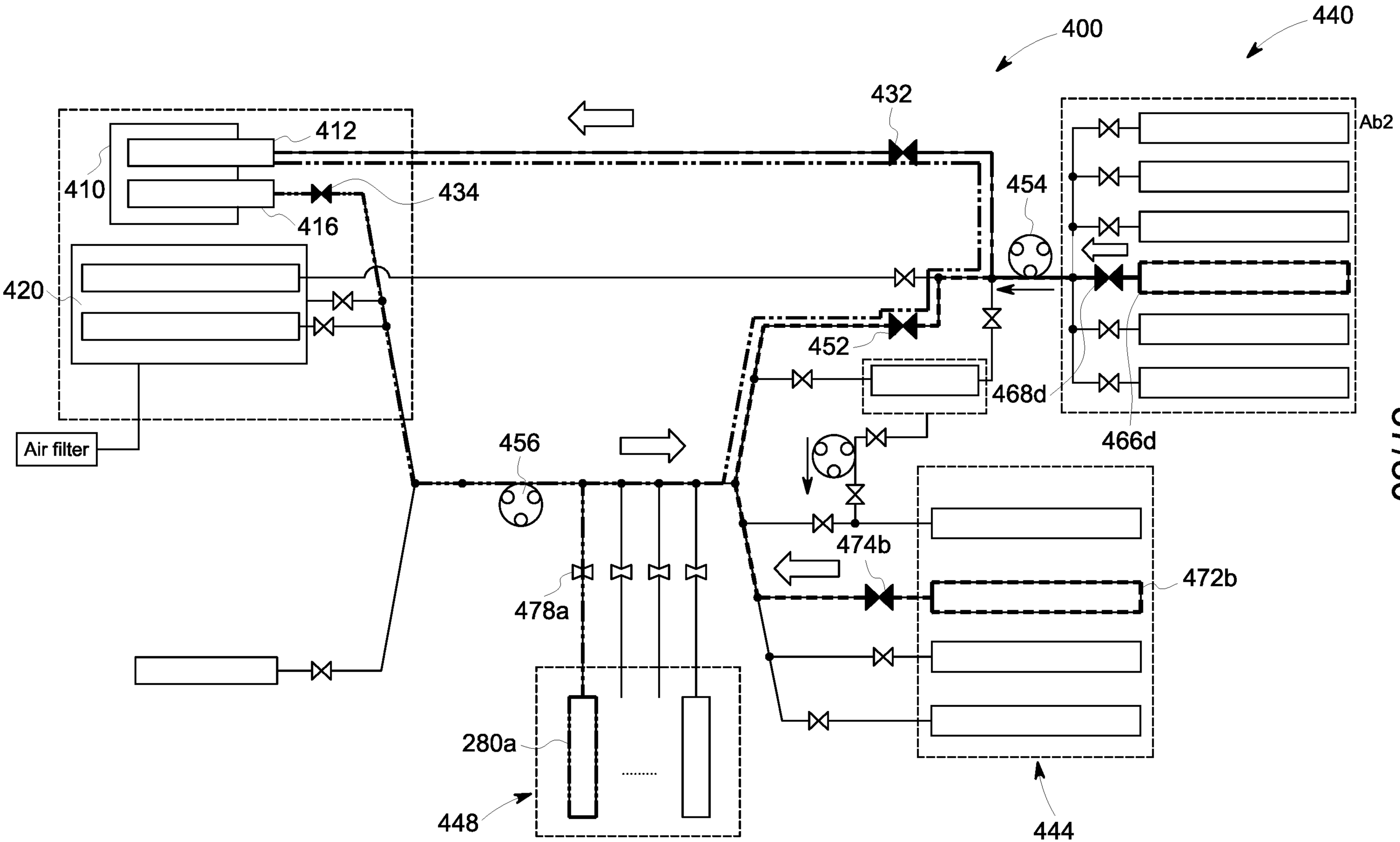

400
440
432
412
410
434
416
420
Air filter
454
452
468d
466d
Ab2
456
474b
472b
478a
280a
448
444

FIG. 58

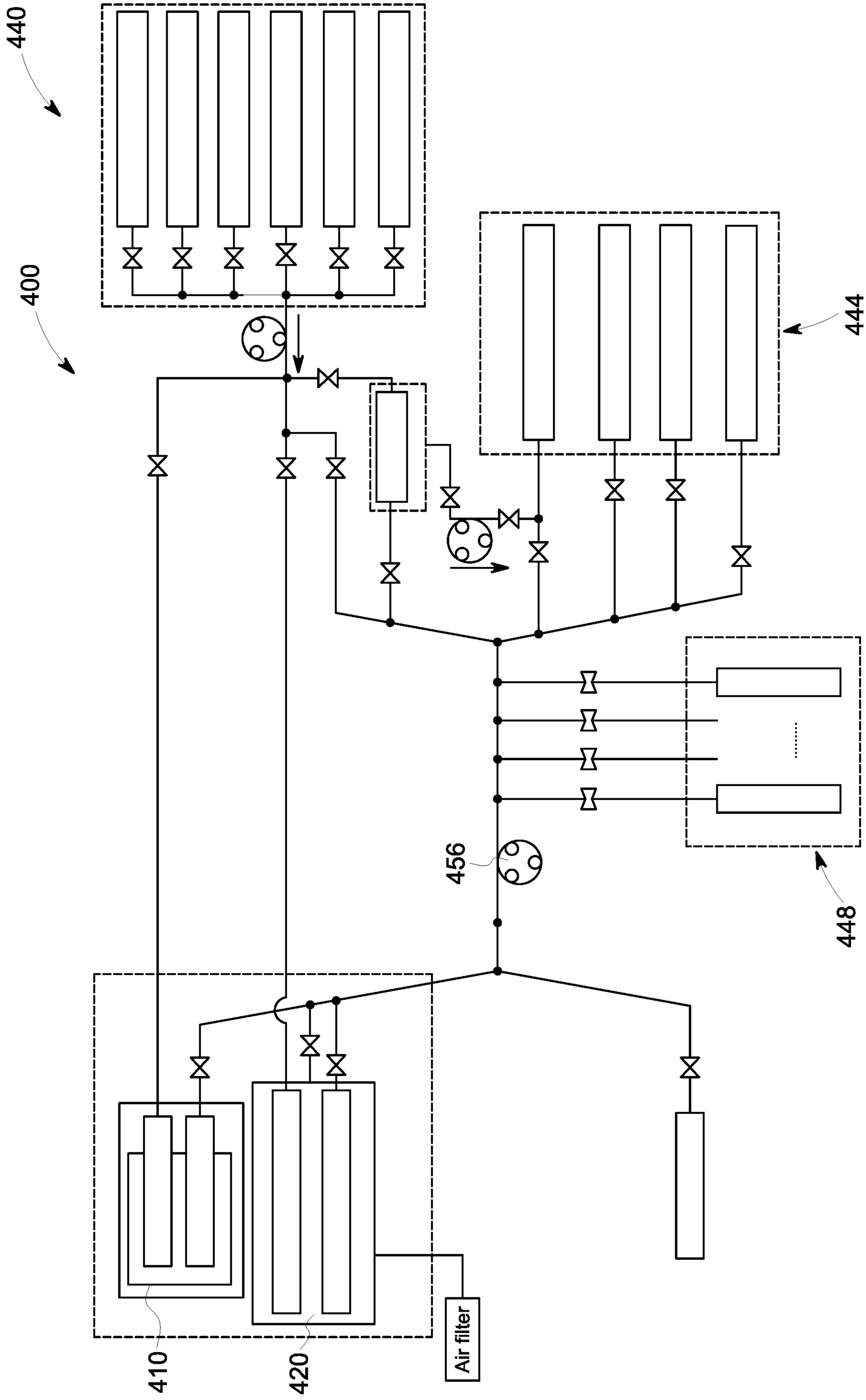


FIG. 59

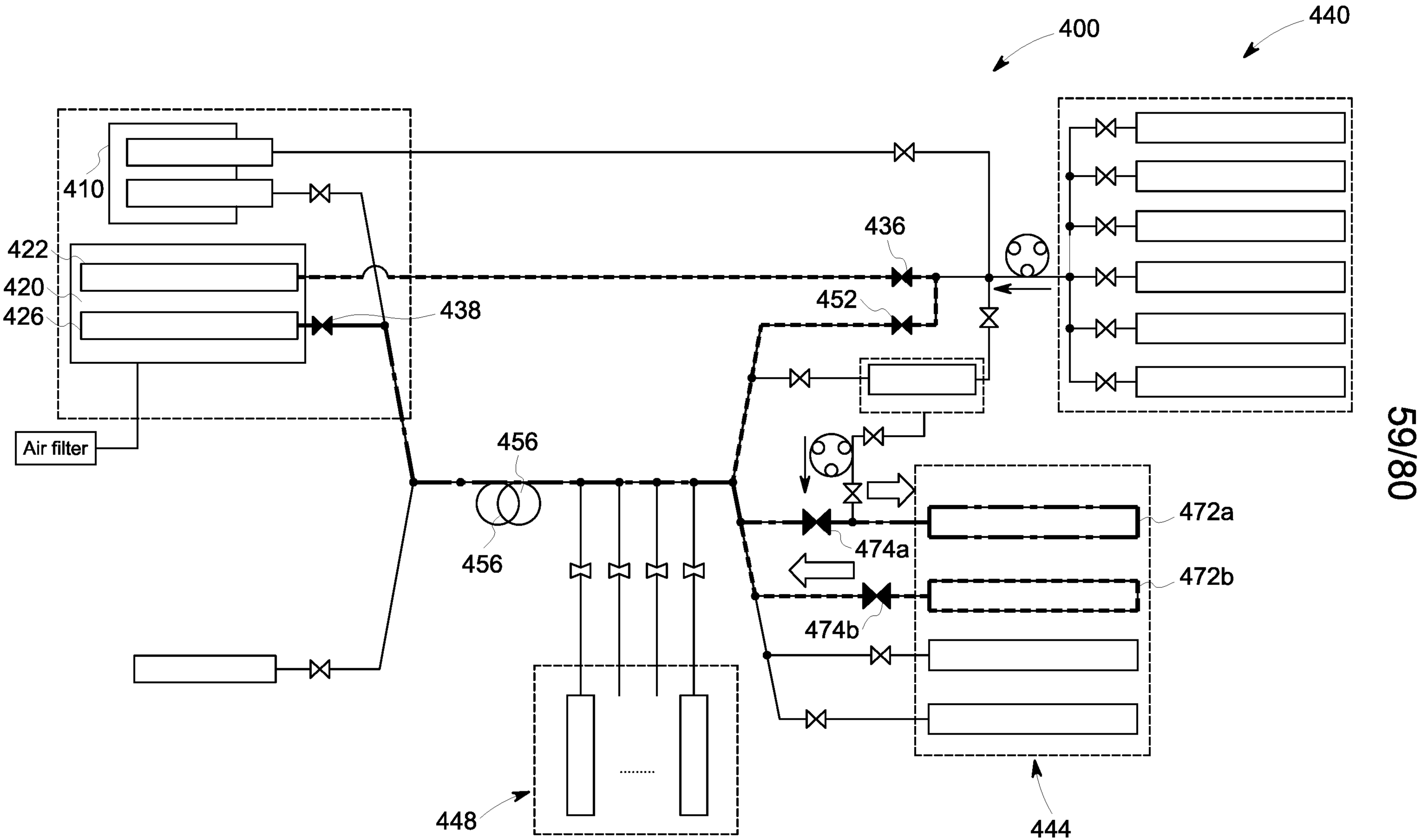

400
440
410
422
420
426
436
452
438
Air filter
456
456
472a
474a
472b
474b
448
444

FIG. 60

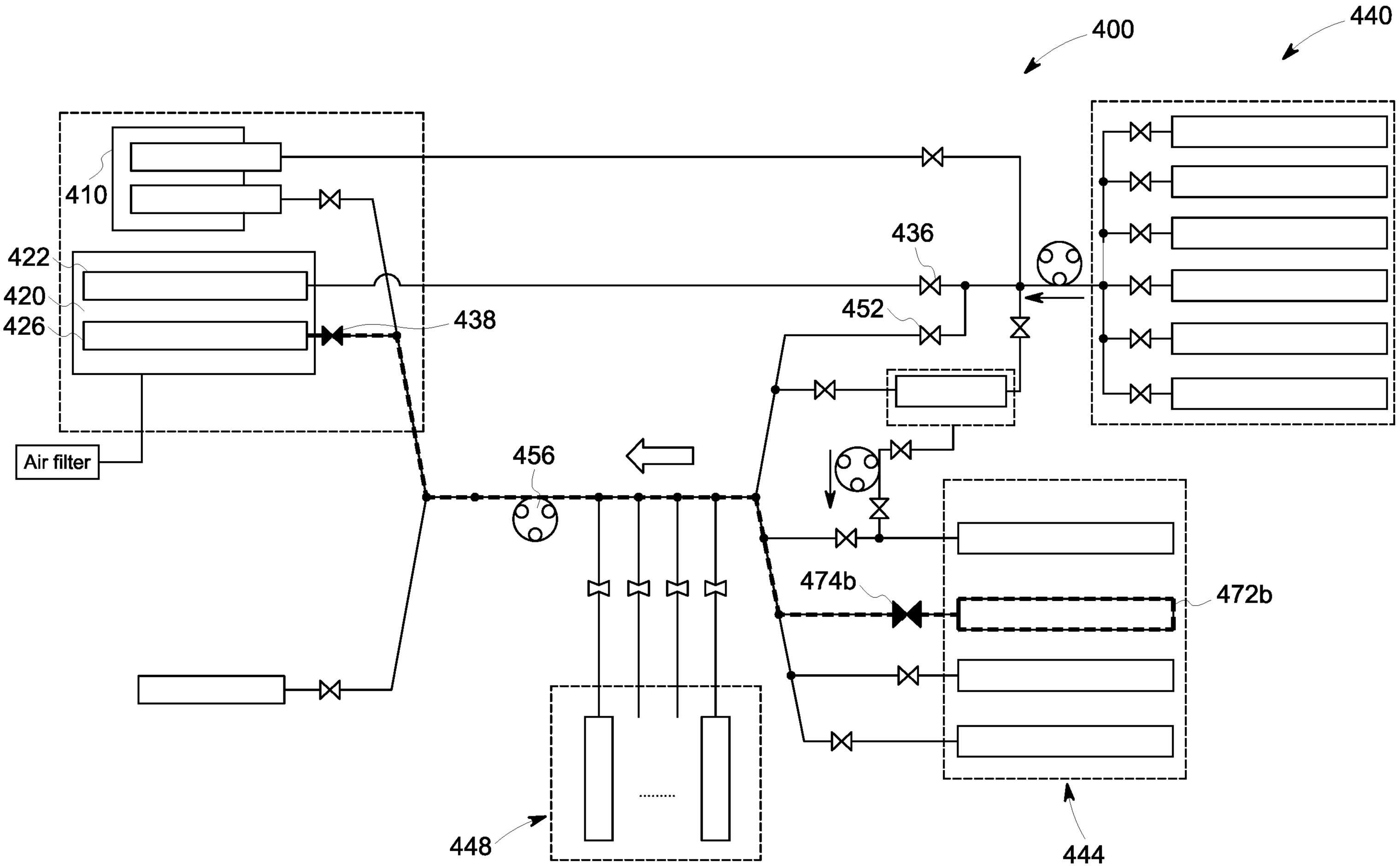

400
440
410
422
420
426
438
436
452
456
Air filter
474b
472b
448
444

FIG. 61

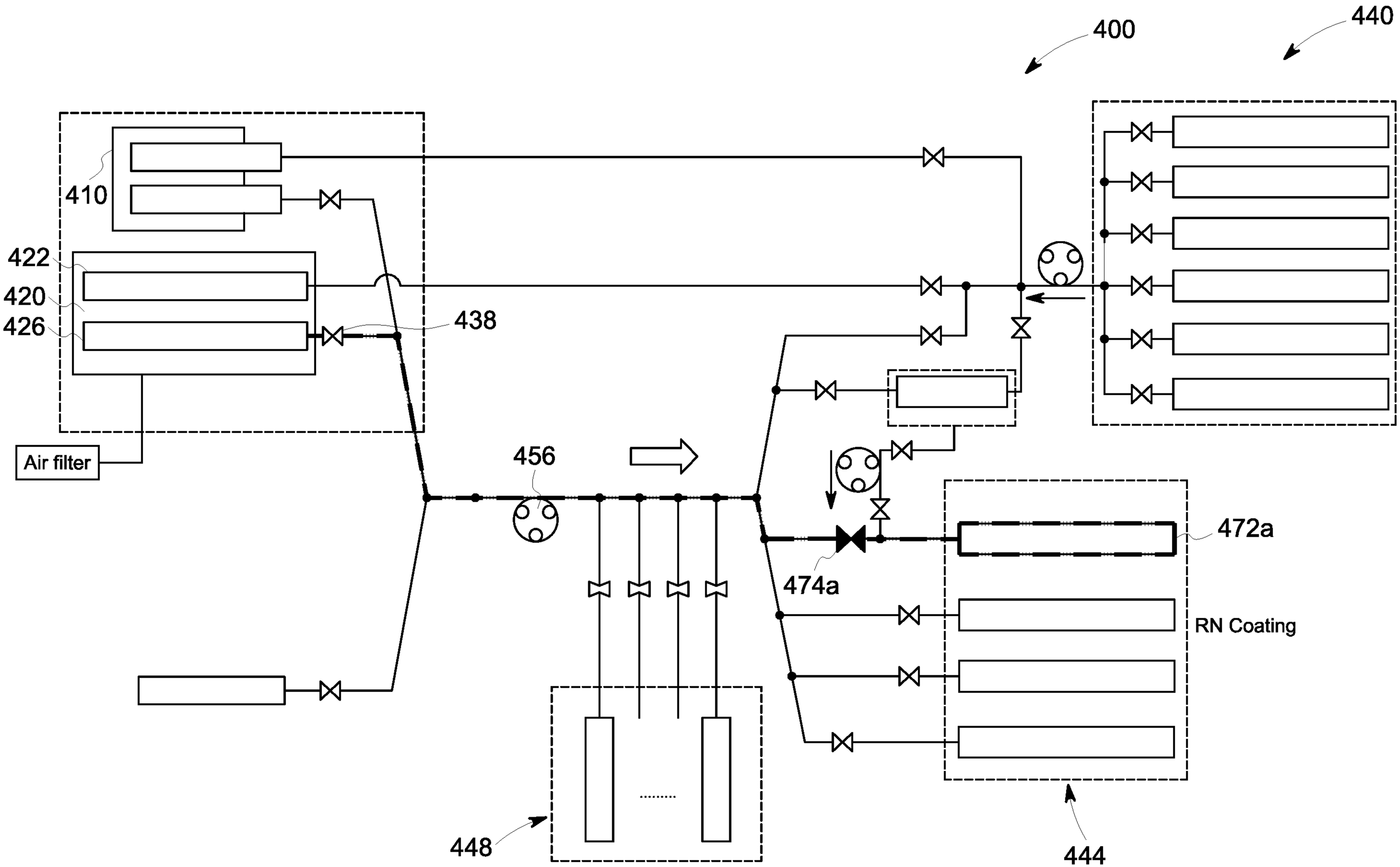

400
440
410
422
420
426
438
Air filter
456
472a
474a
RN Coating
448
444

FIG. 62

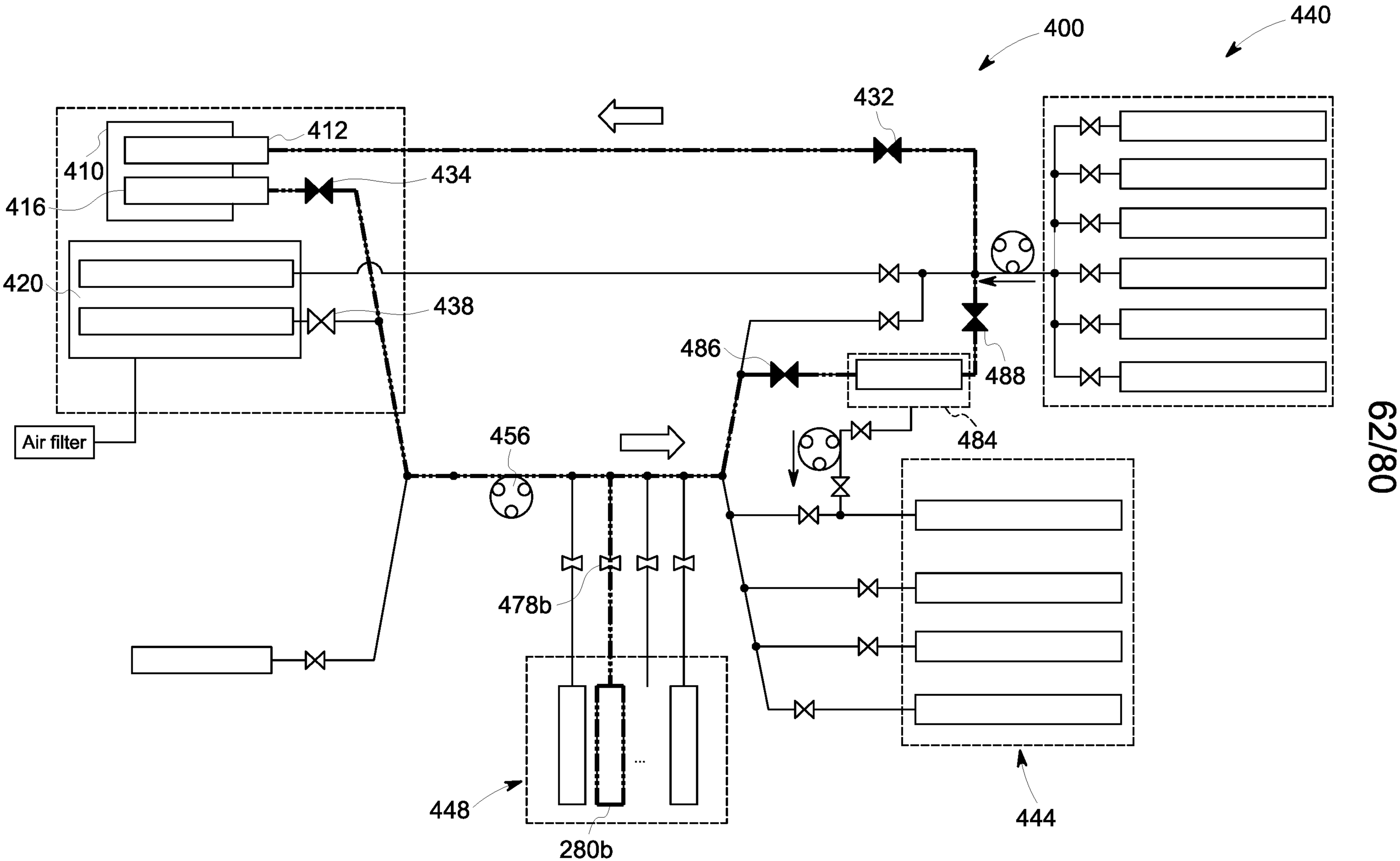

400
440
412
410
416
434
432
420
438
486
488
484
Air filter
456
478b
448
280b
444

FIG. 63

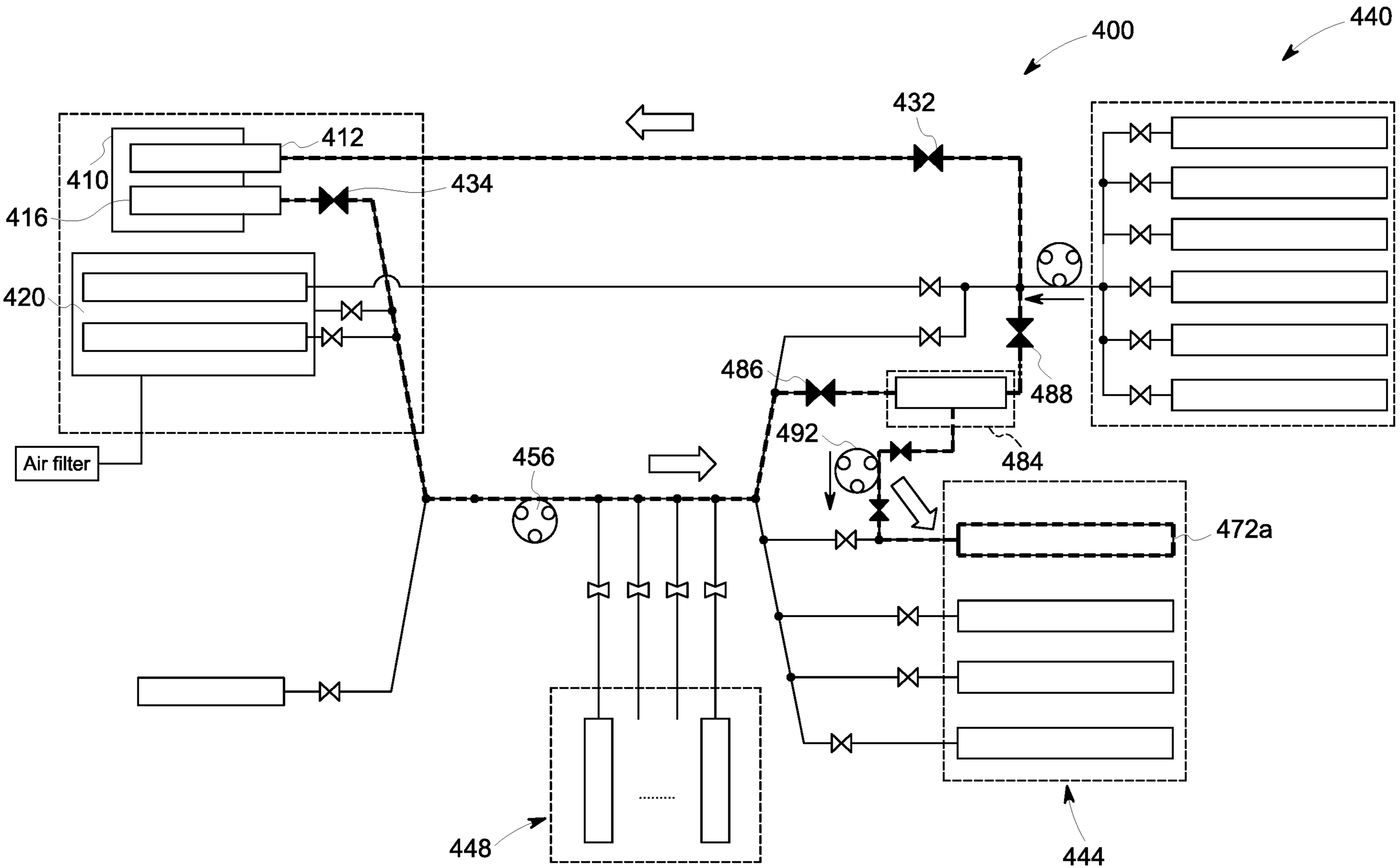

400
440
412
410
416
434
432
420
Air filter
456
486
488
492
484
472a
448
444

FIG. 64

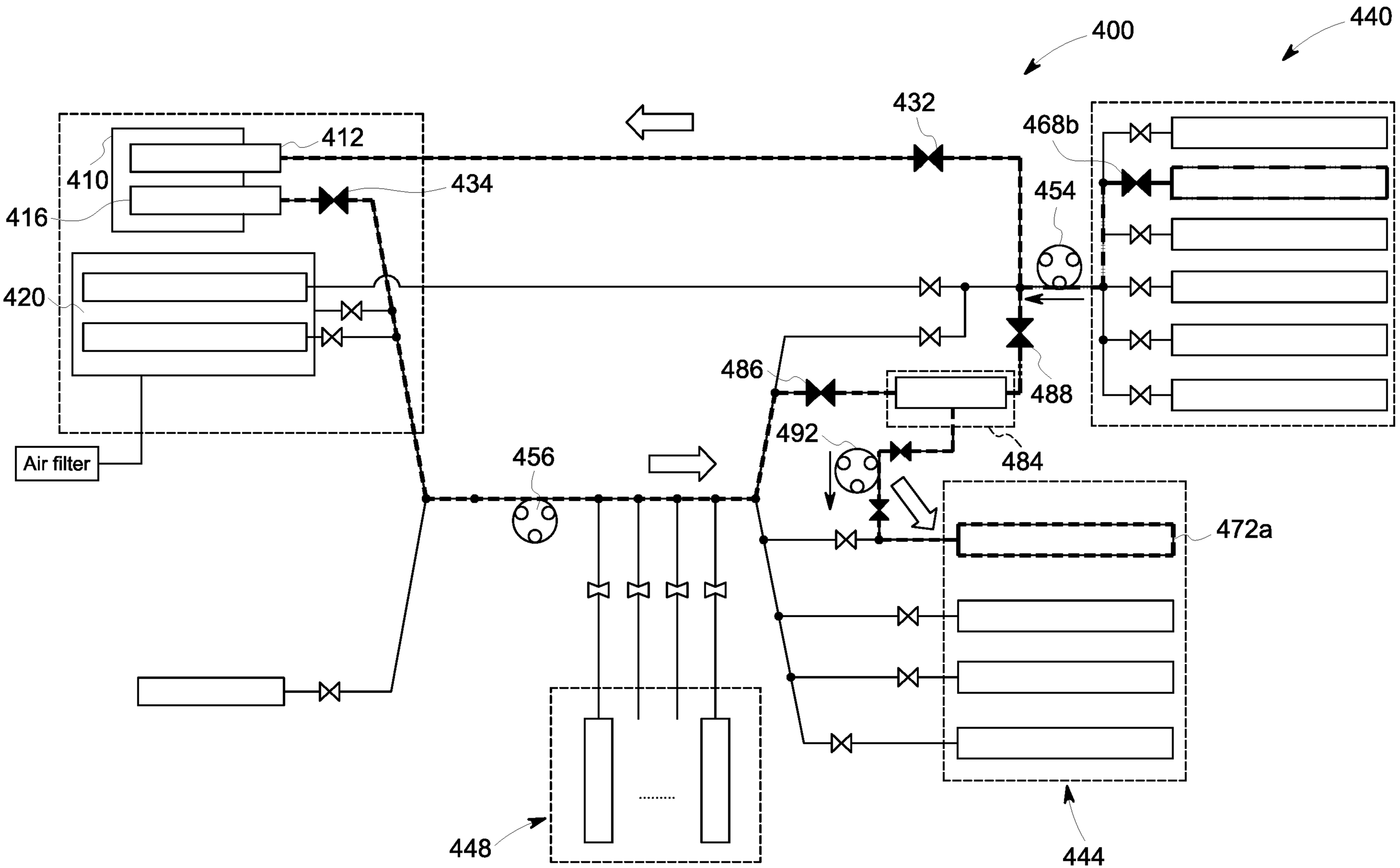

400
440
412
410
434
432
468b
454
416
420
486
488
492
484
456
472a
Air filter
448
444

FIG. 65

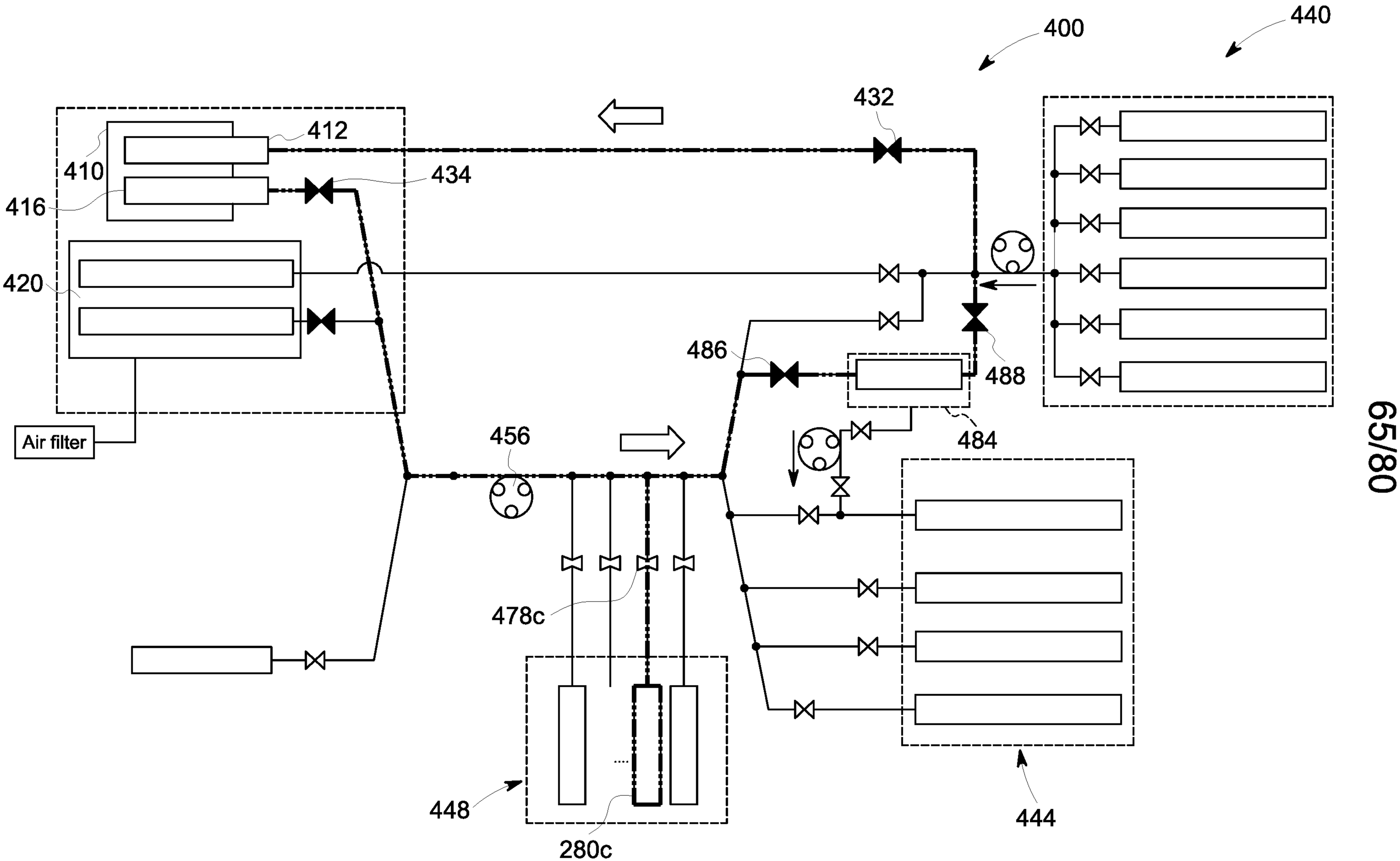

400
440
432
412
410
434
416
420
Air filter
486
488
484
456
478c
448
280c
444

FIG. 66

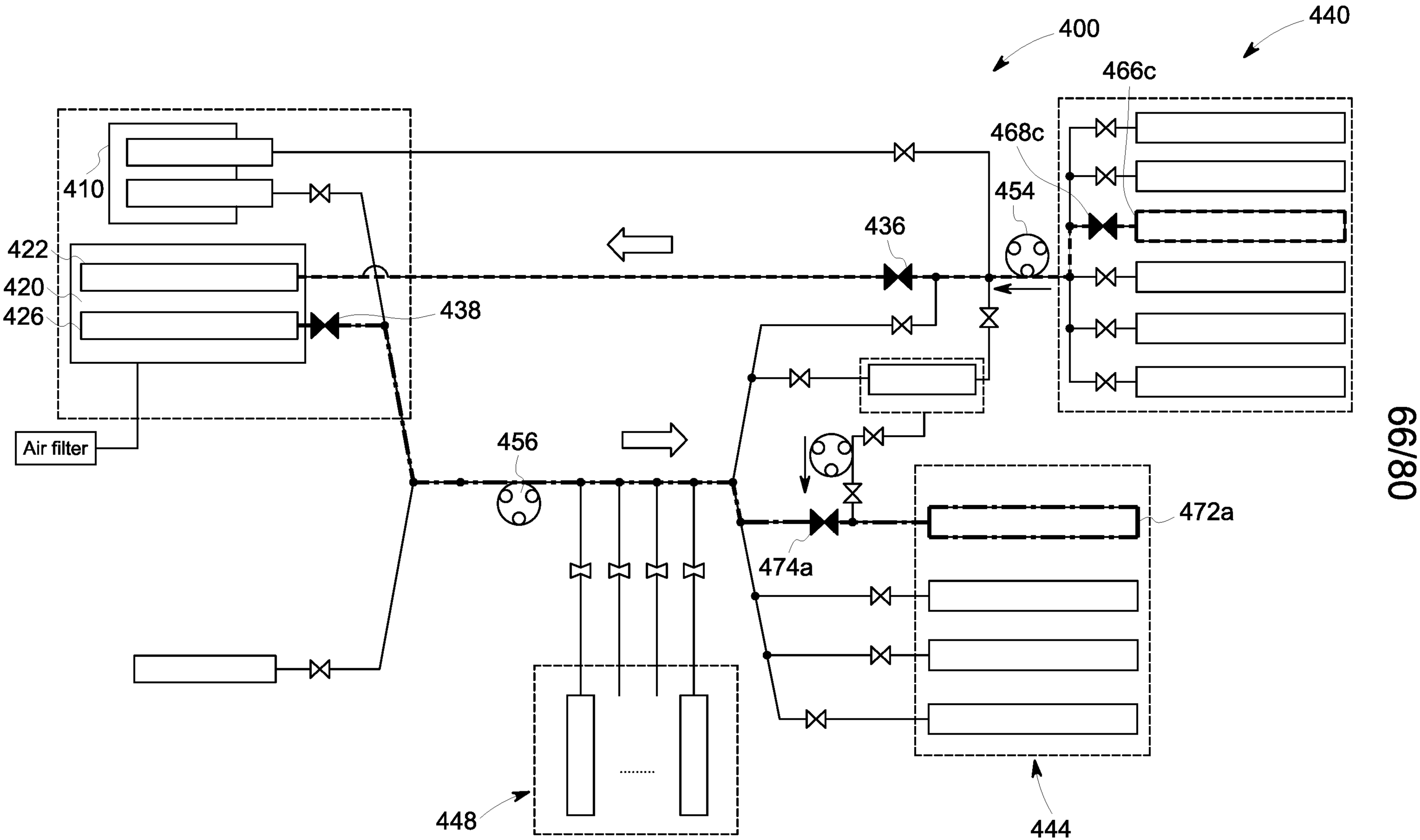

400
440
466c
468c
454
410
436
422
420
426
438
Air filter
456
472a
474a
448
444

FIG. 67

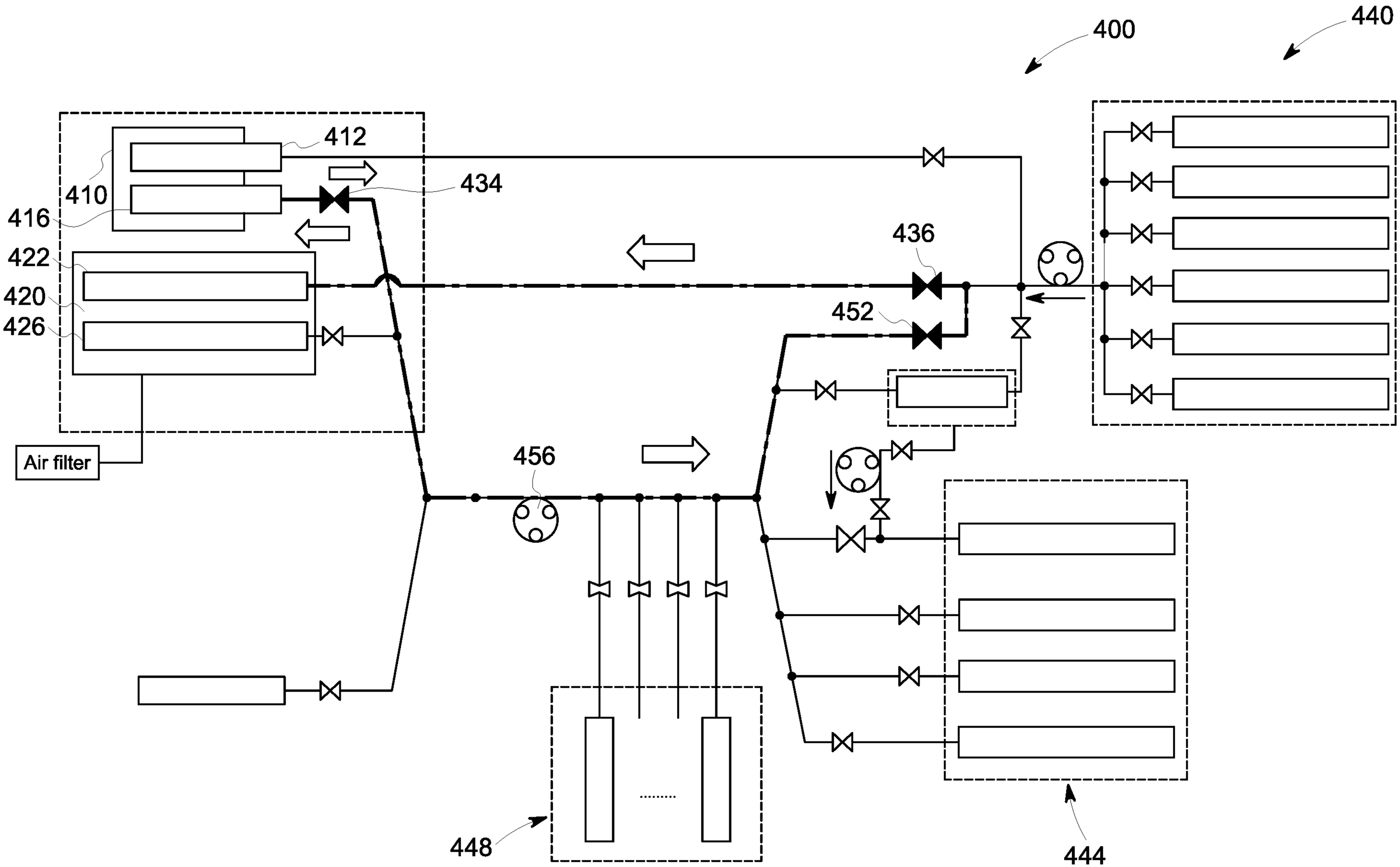

400
440
412
410
434
416
422
420
426
436
452
456
Air filter
448
444

FIG. 68

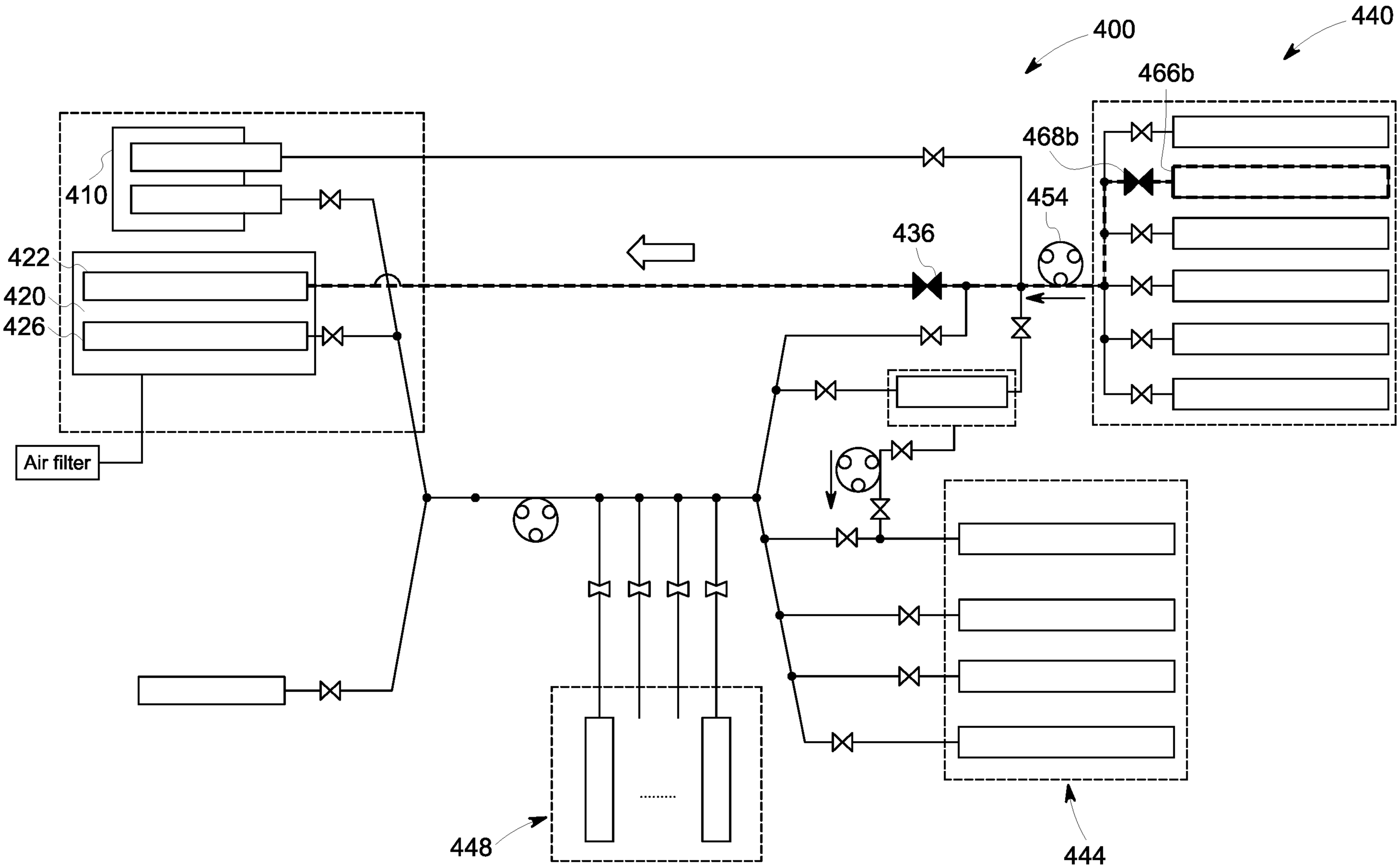


FIG. 69

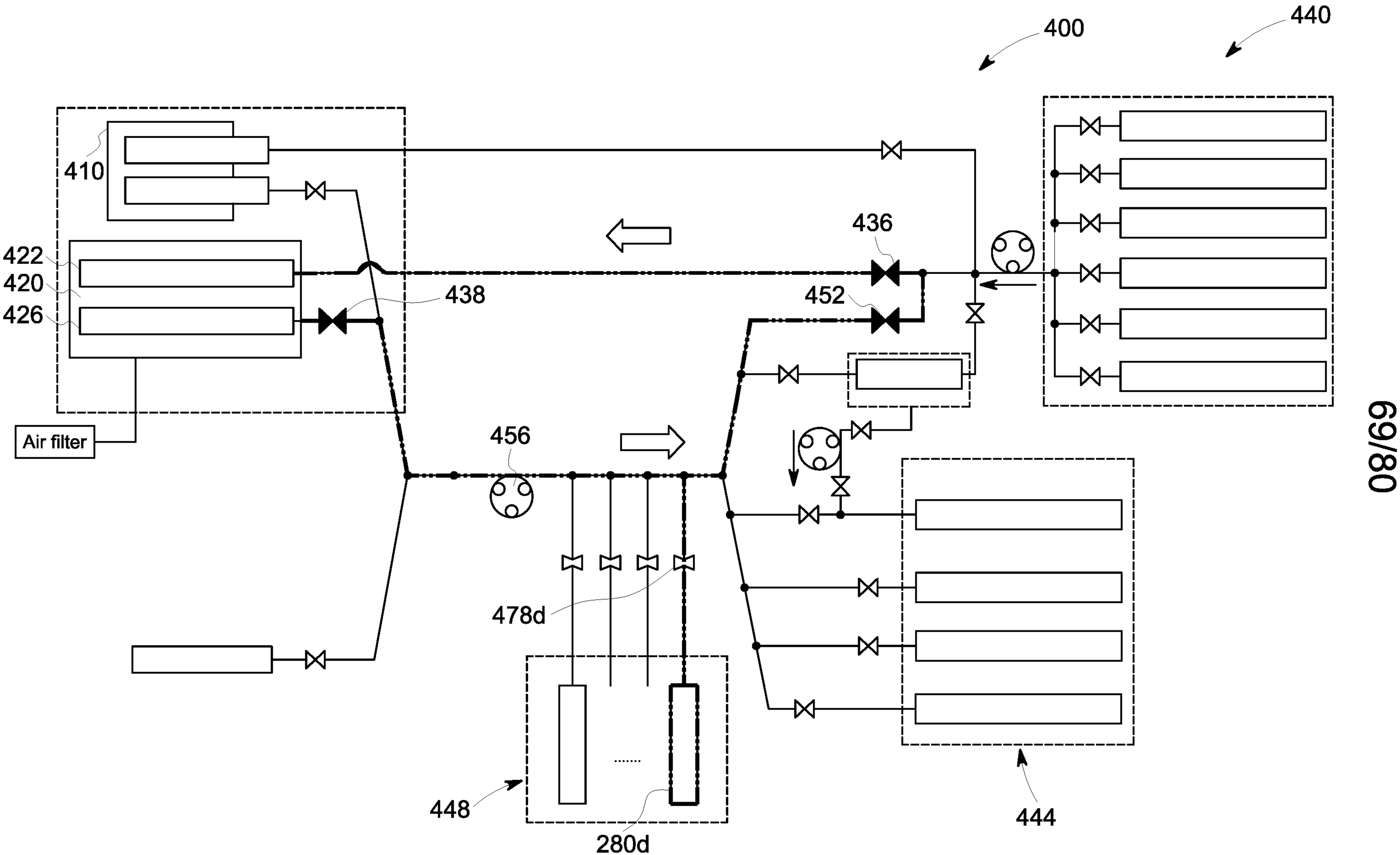

400
440
410
422
420
426
438
436
452
456
Air filter
478d
448
280d
444

FIG. 70

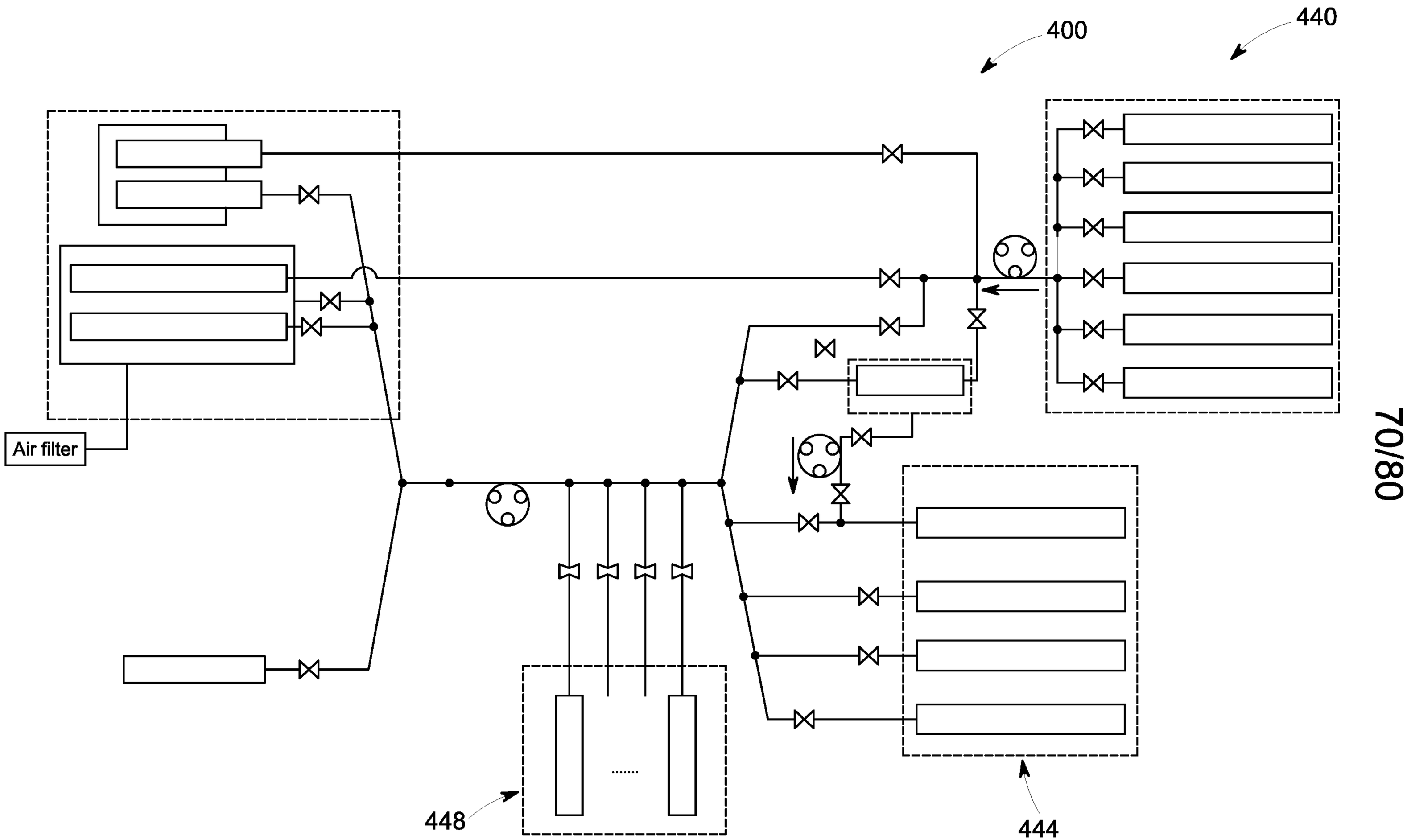


FIG. 71

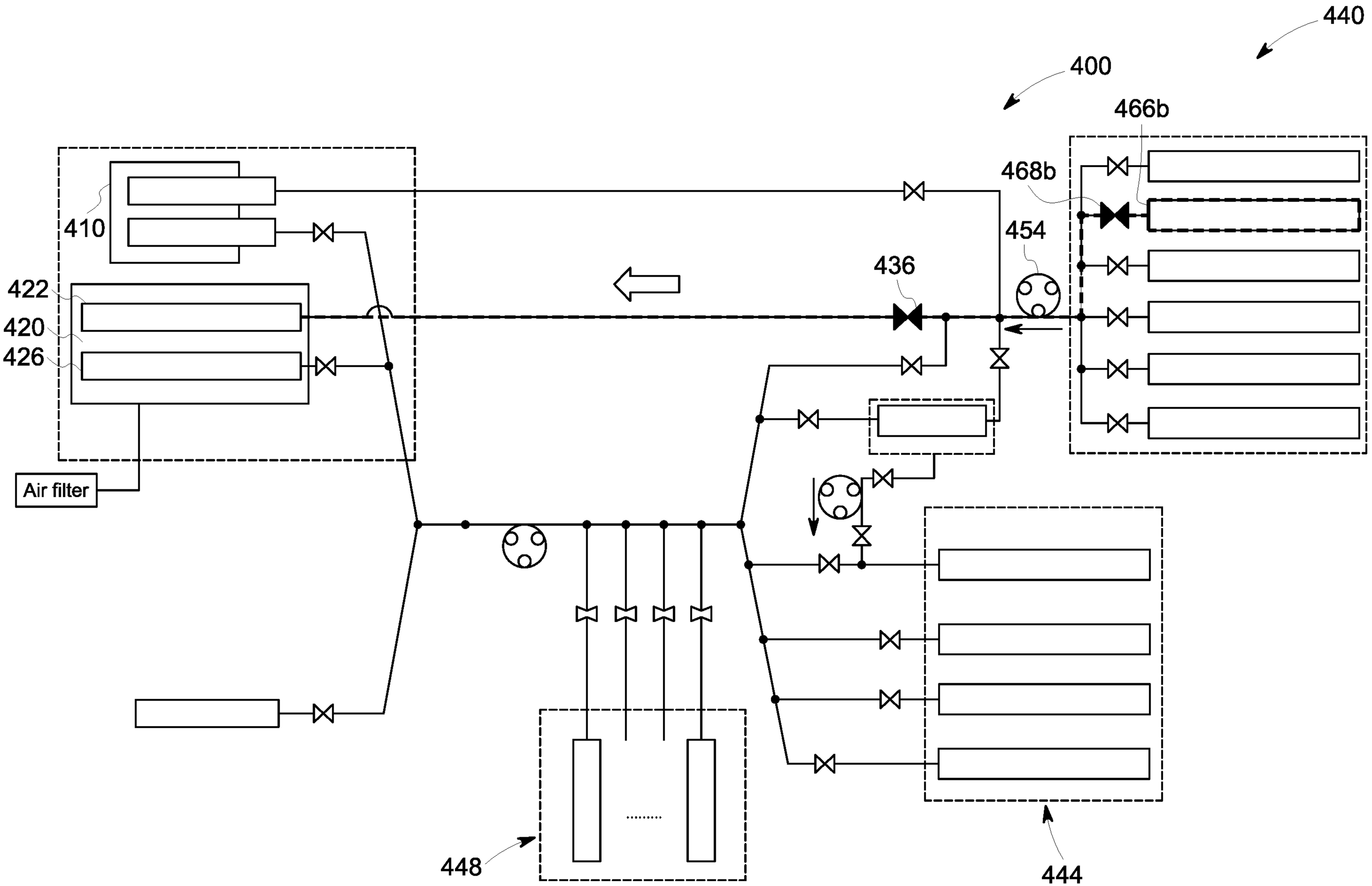


FIG. 72

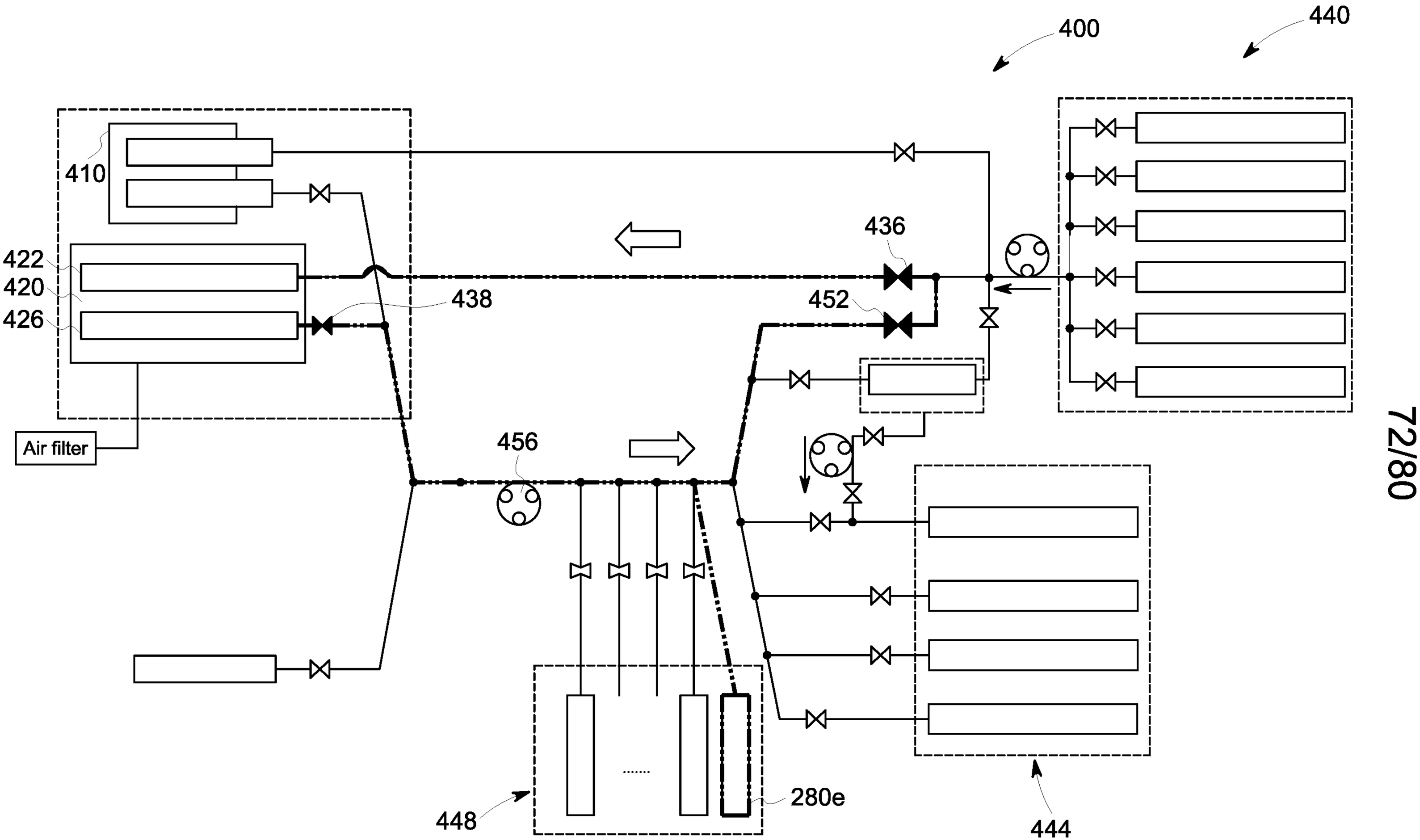


FIG. 73

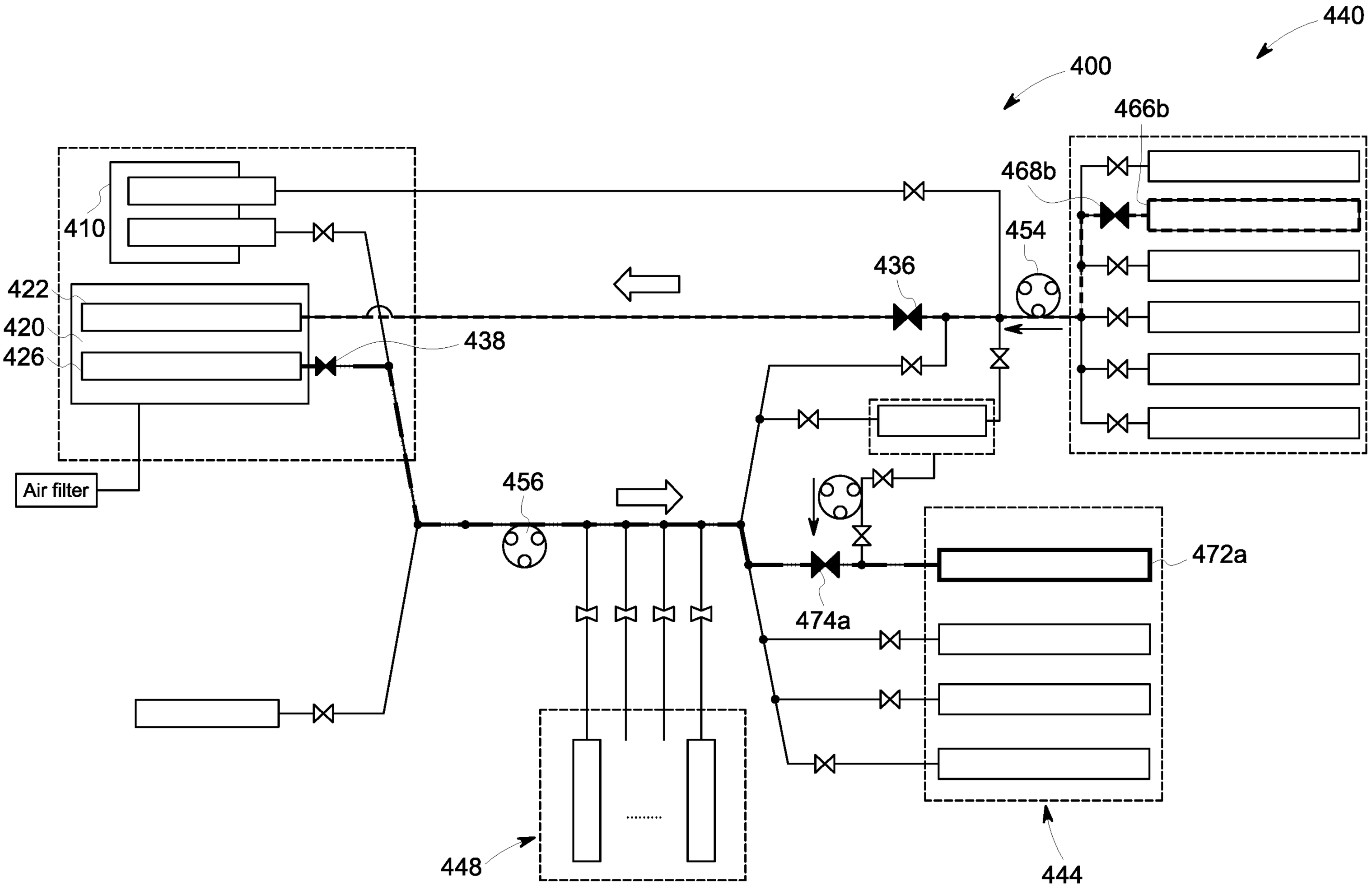

440
400
466b
468b
454
436
410
422
420
426
438
Air filter
456
472a
474a
448
444

FIG. 74

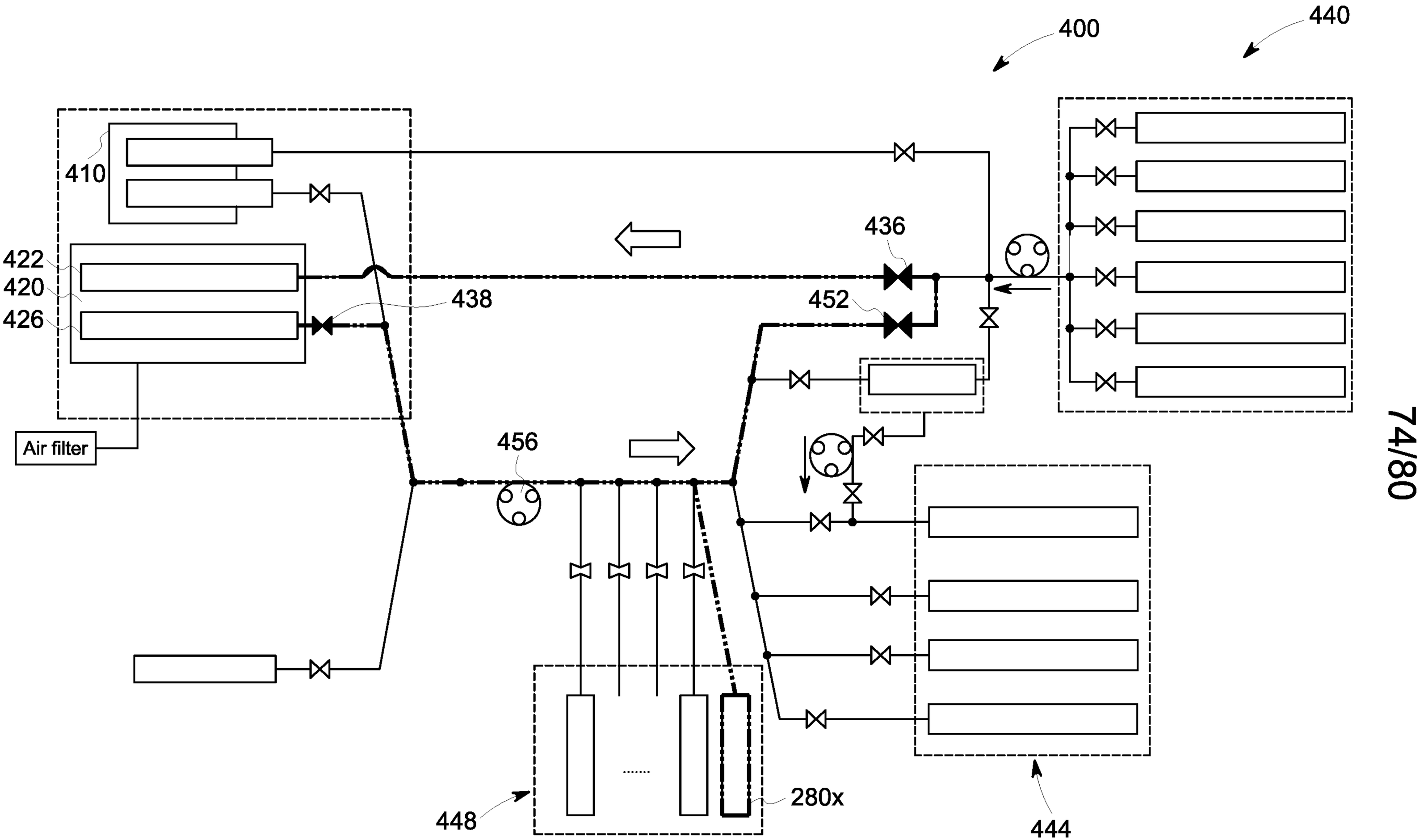


FIG. 75

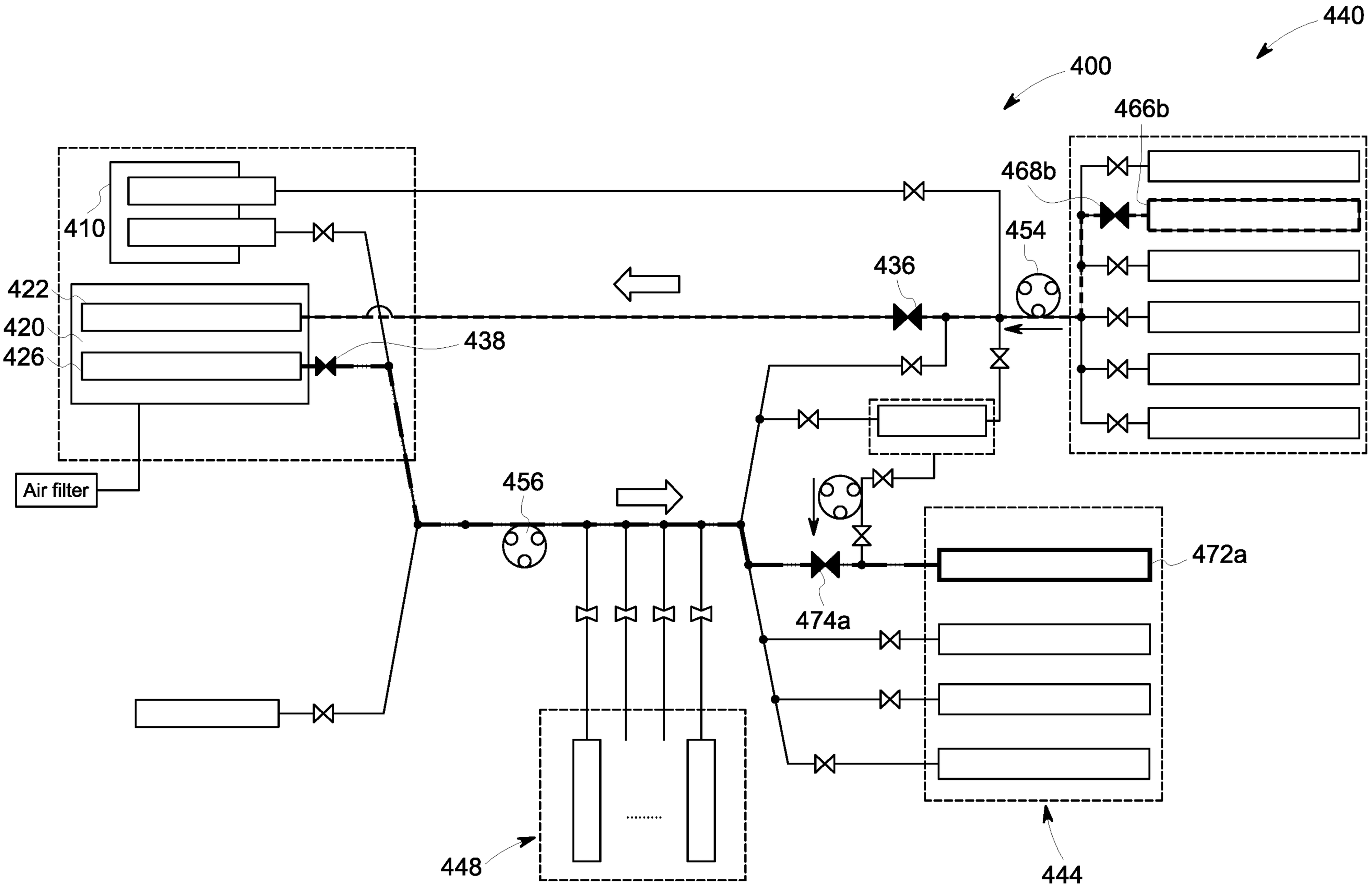

440
400
466b
468b
454
436
410
422
420
426
438
Air filter
456
472a
474a
448
444

FIG. 76

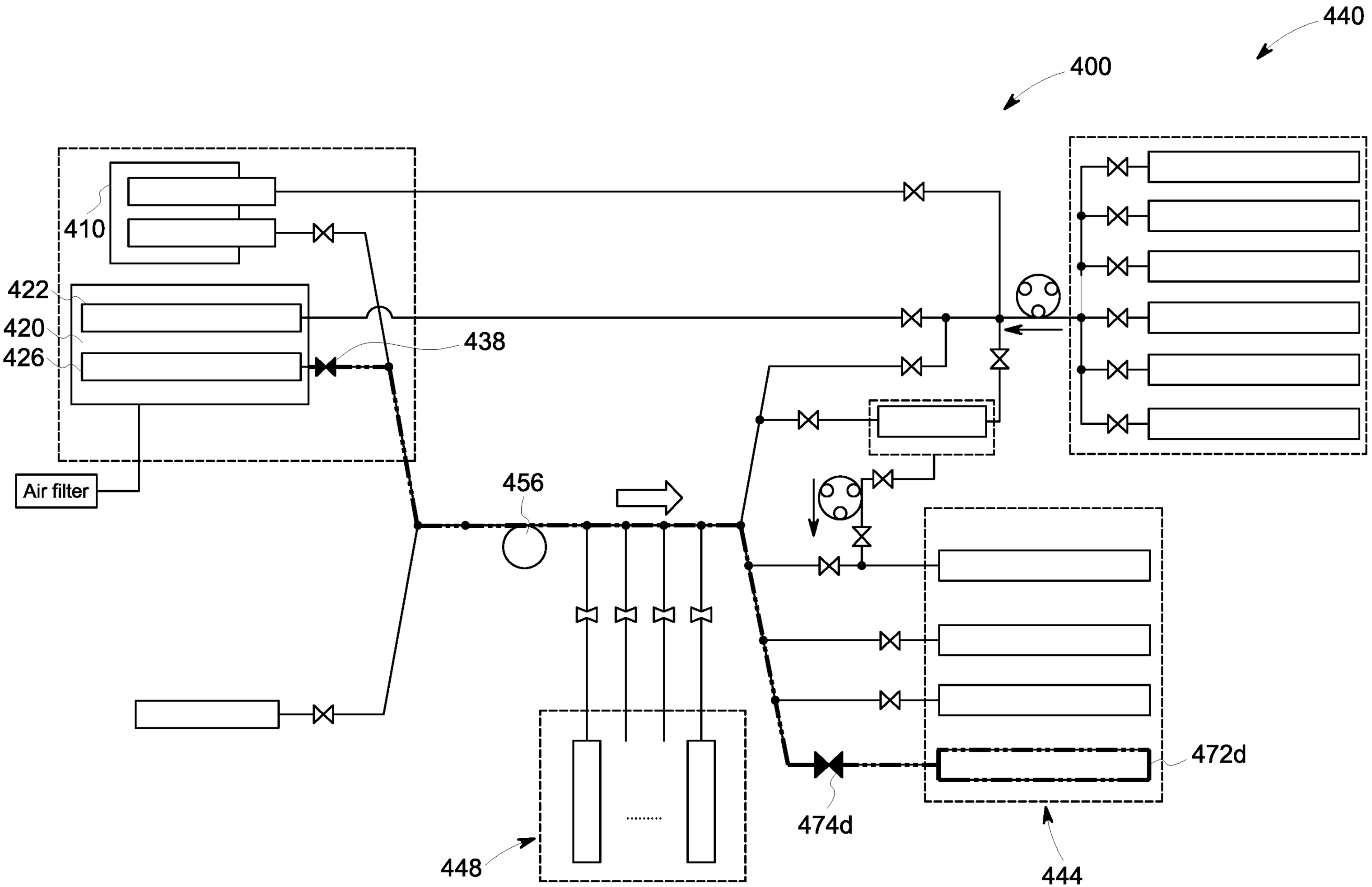


FIG. 77

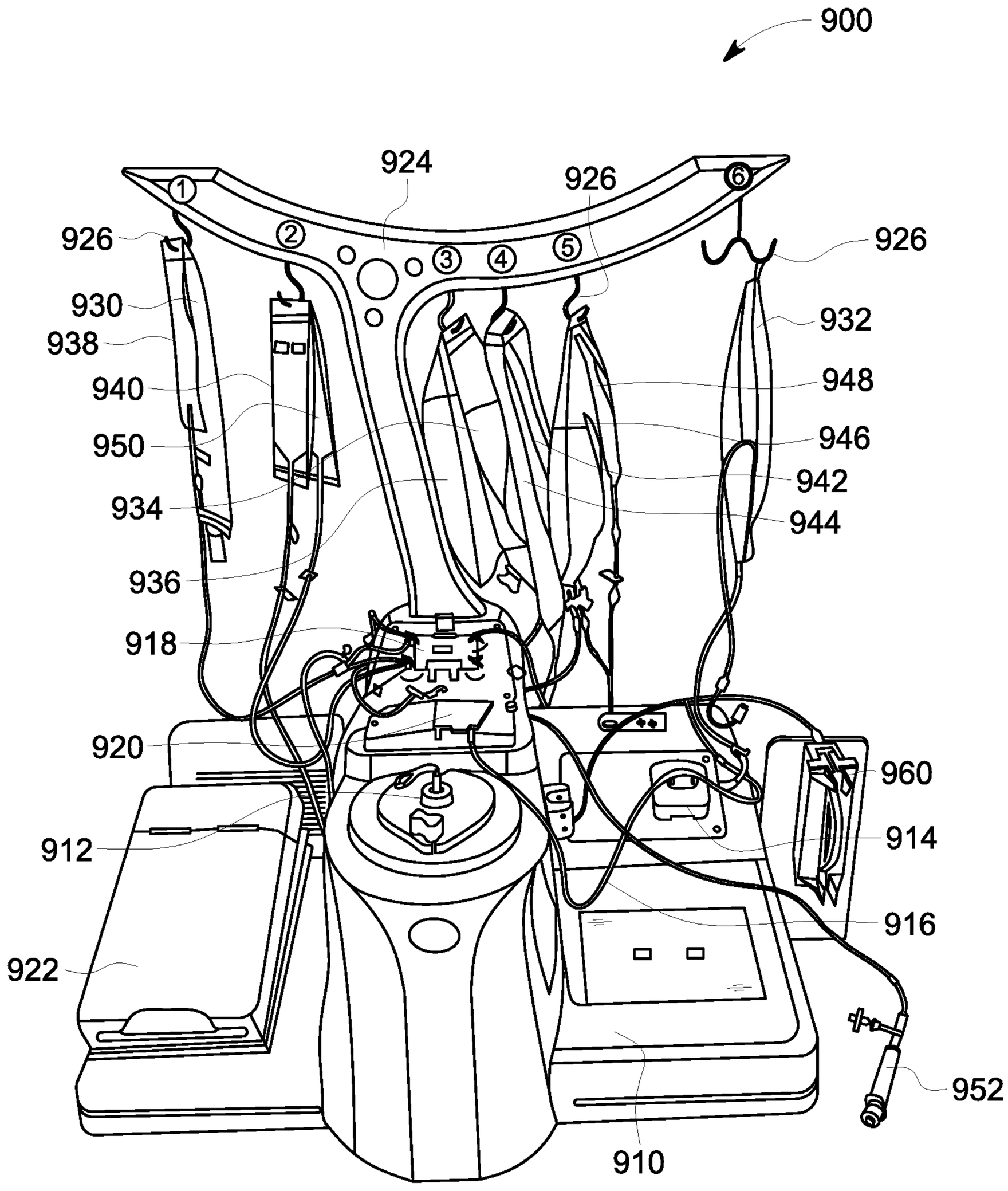

900
924
926
926
926
930
938
940
950
934
936
918
932
948
946
942
944
920
960
914
912
916
922
952
910

FIG. 78

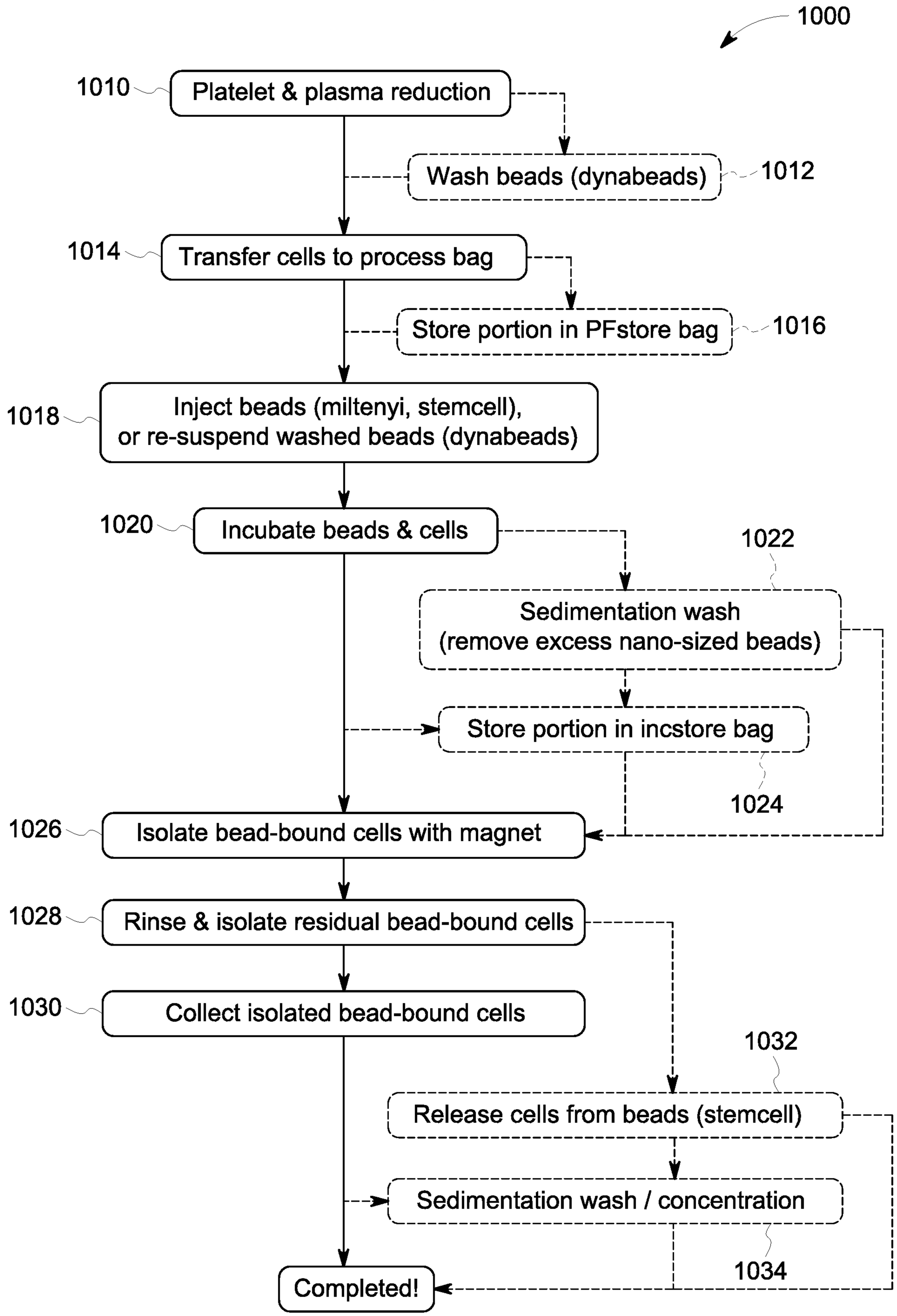

1000
1010
Platelet & plasma reduction
Wash beads (dynabeads)
1012
1014
Transfer cells to process bag
Store portion in PFstore bag
1016
1018
Inject beads (miltenyi, stemcell),
or re-suspend washed beads (dynabeads)
1020
Incubate beads & cells
1022
Sedimentation wash
(remove excess nano-sized beads)
Store portion in incstore bag
1024
1026
Isolate bead-bound cells with magnet
1028
Rinse & isolate residual bead-bound cells
1030
Collect isolated bead-bound cells
1032
Release cells from beads (stemcell)
Sedimentation wash / concentration
1034
Completed!

FIG. 79

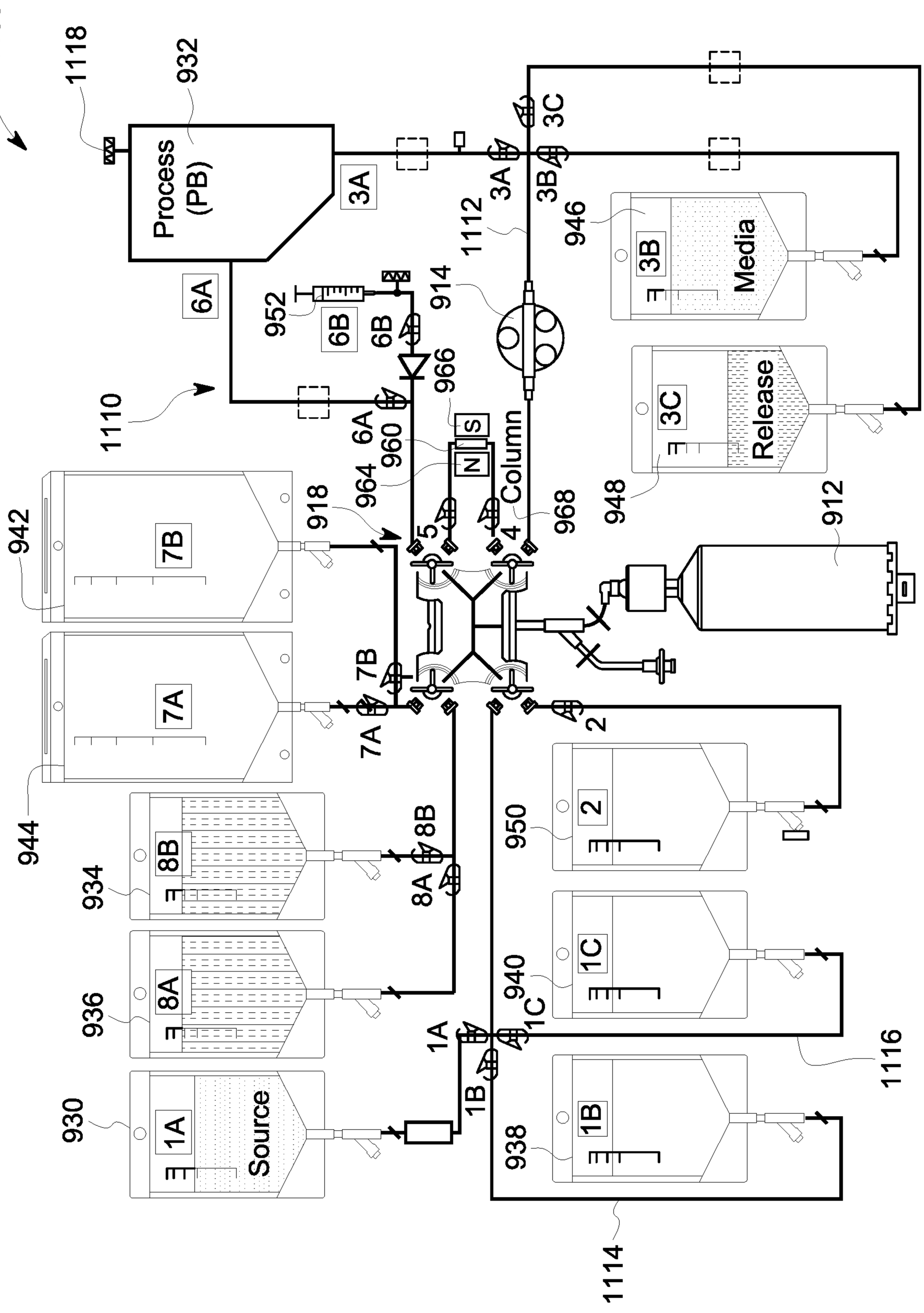

1100
1118
932
Process (PB)
3A
3C
3B
1112
946
Media
6A
952
6B
914
966
1110
960
S
N
964
Column
968
942
7B
918
5
4
948
912
7A
2
944
8B
950
934
8A
936
1C
940
1A
1116
930
Source
1B
938
1114

FIG. 80

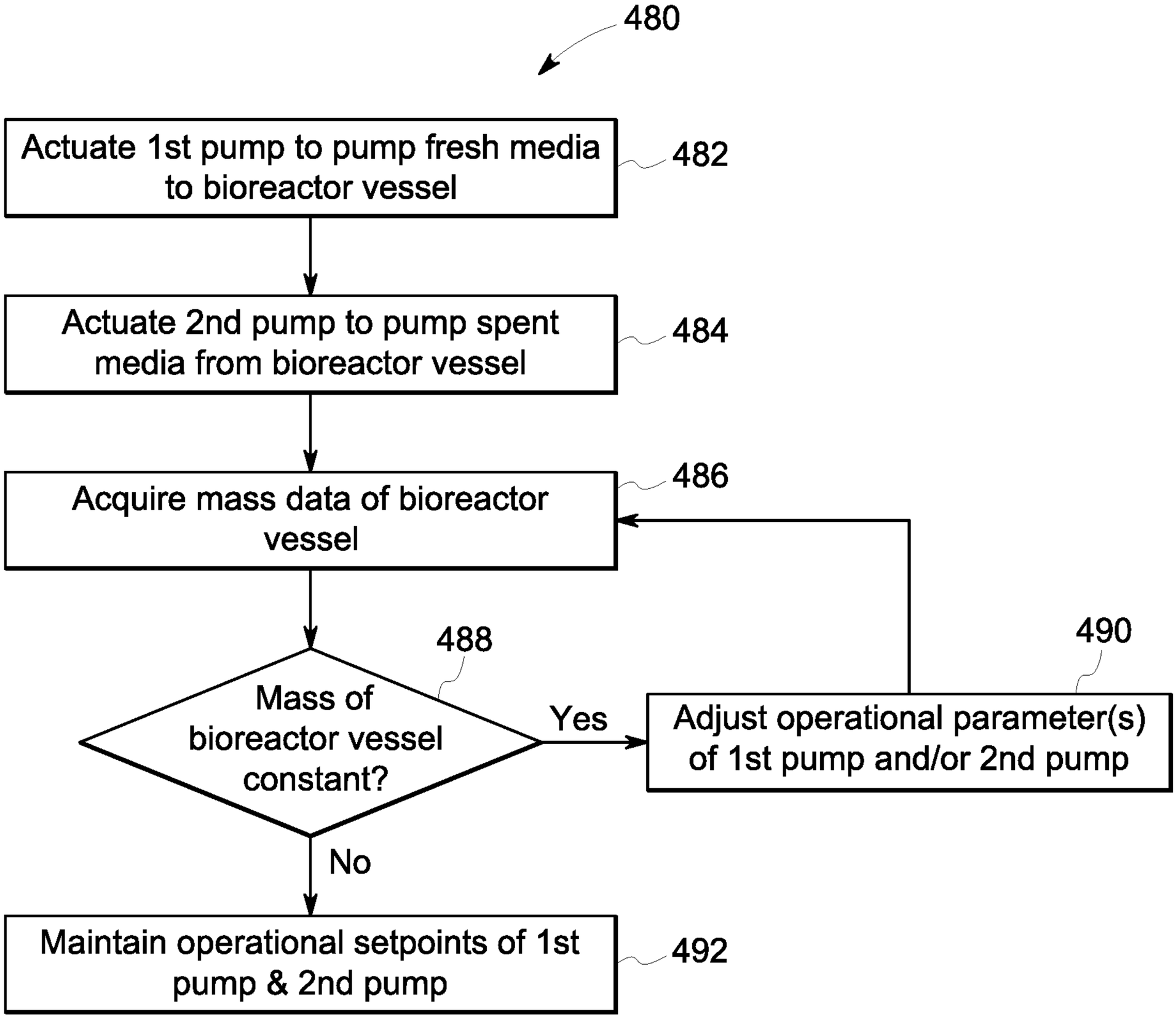

480
Actuate 1st pump to pump fresh media to bioreactor vessel
482
Actuate 2nd pump to pump spent media from bioreactor vessel
484
Acquire mass data of bioreactor vessel
486
488
Mass of bioreactor vessel constant?
Yes
No
490
Adjust operational parameter(s) of 1st pump and/or 2nd pump
Maintain operational setpoints of 1st pump & 2nd pump
492

FIG. 81