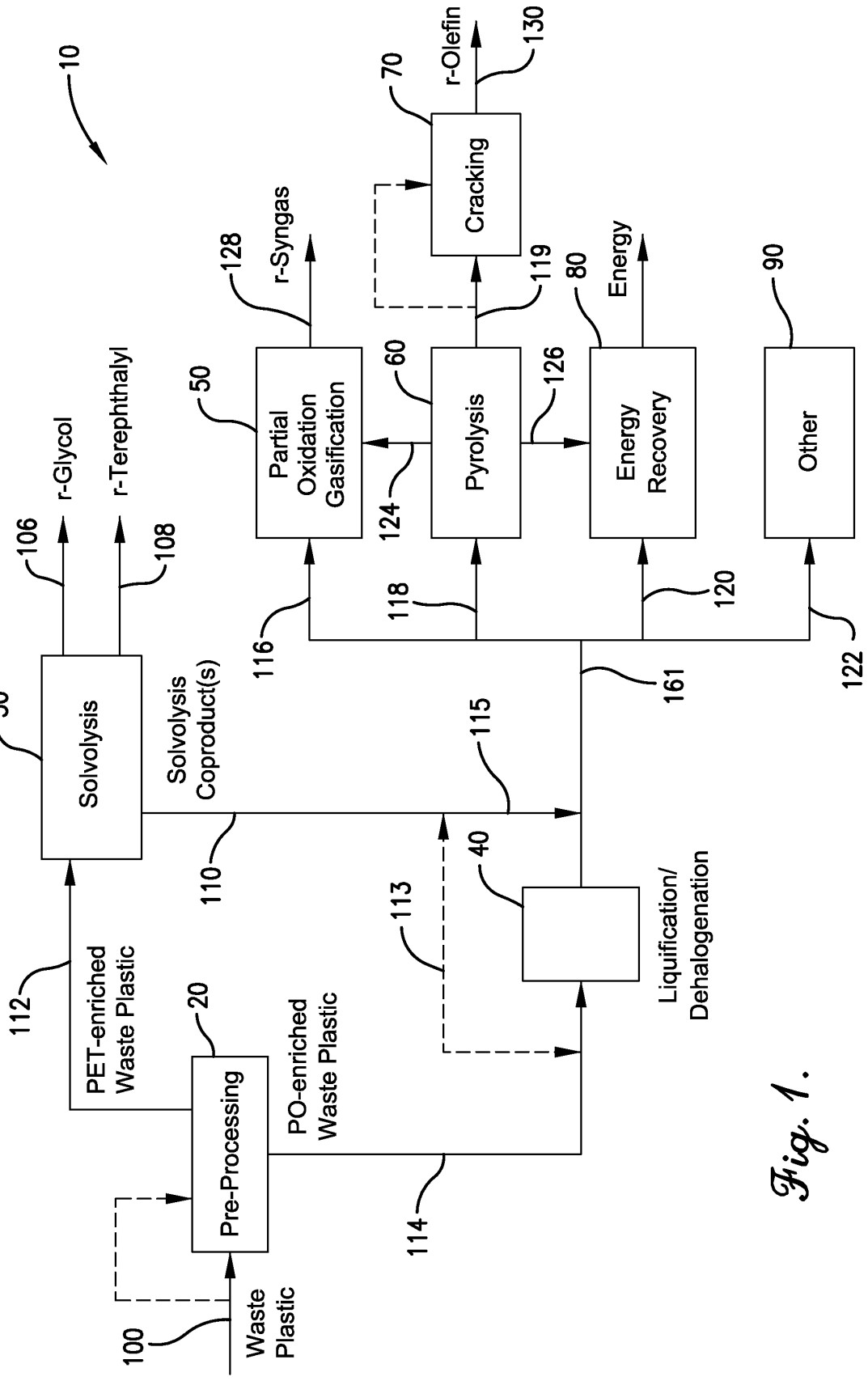
10
Waste Plastic
100
Pre-Processing
20
PET-enriched Waste Plastic
112
PO-enriched Waste Plastic
114
Solvolysis
30
r-Glycol
106
r-Terephthalyl
108
Solvolysis Coproduct(s)
110
Partial Oxidation Gasification
50
r-Syngas
128
Pyrolysis
60
124
126
Cracking
70
r-Olefin
130
119
Energy Recovery
80
Energy
Other
90
116
118
120
122
161
115
113
40
Liquification/ Dehalogenation

Fig. 1.

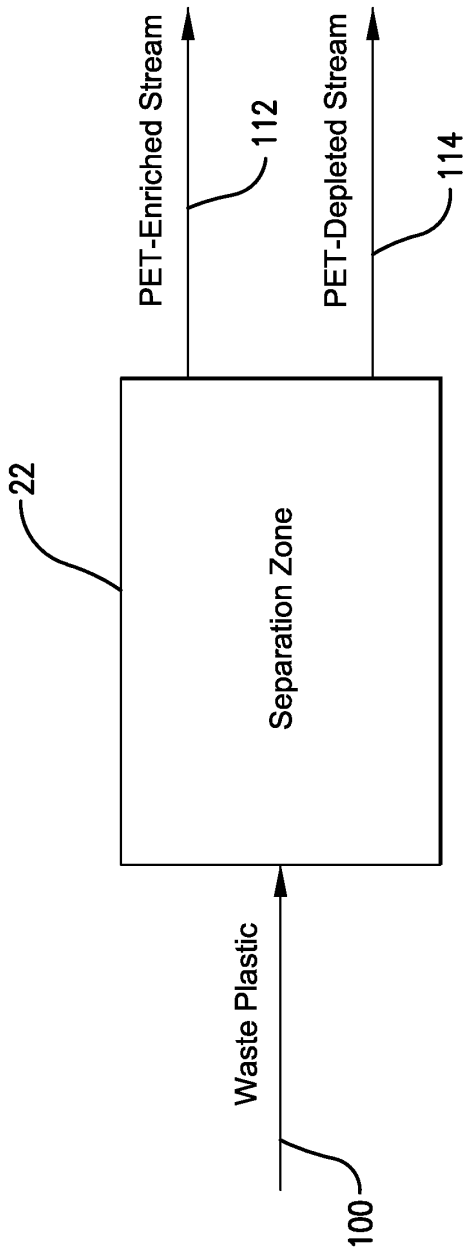
PET-Enriched Stream
112
PET-Depleted Stream
114
22
Separation Zone
Waste Plastic
100

Fig. 2.

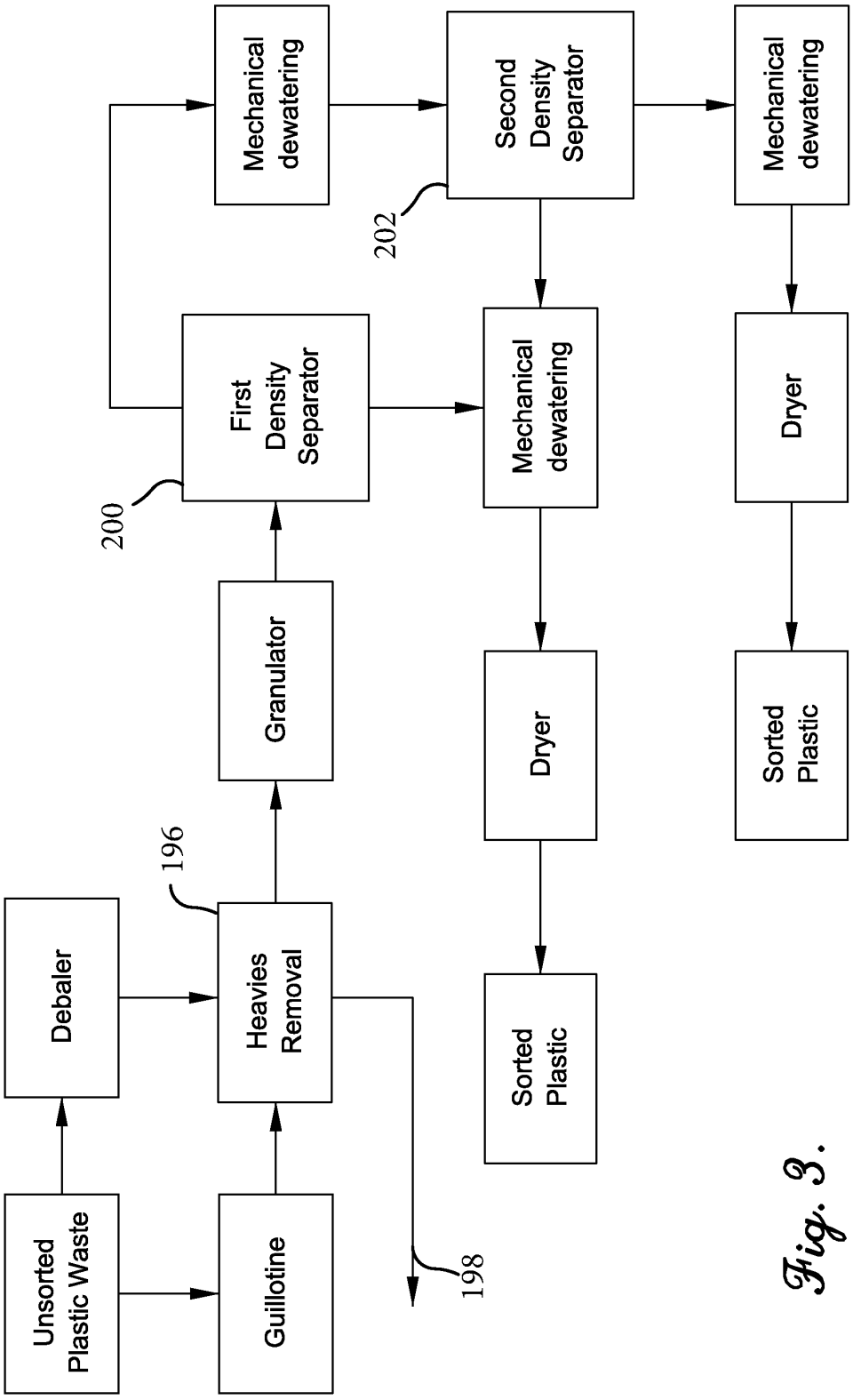
Unsorted Plastic Waste
Guillotine
Debaler
Heavies Removal
196
198
Granulator
First Density Separator
200
Mechanical dewatering
Second Density Separator
202
Mechanical dewatering
Mechanical dewatering
Dryer
Dryer
Sorted Plastic
Sorted Plastic

Fig. 3.

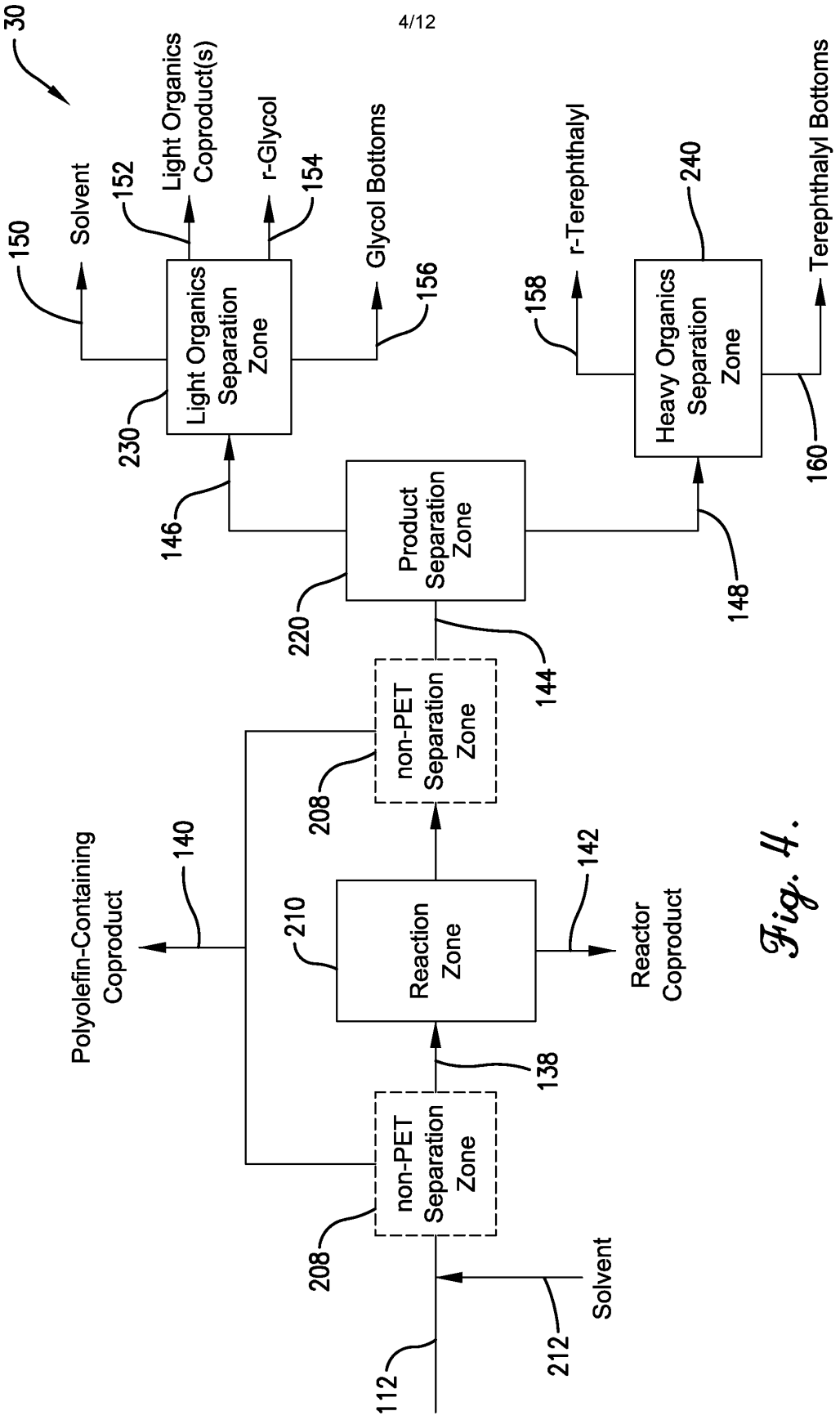
30
Solvent
150
Light Organics Coproduct(s)
152
r-Glycol
154
Glycol Bottoms
156
Light Organics Separation Zone
230
r-Terephthalyl
158
Heavy Organics Separation Zone
240
Terephthalyl Bottoms
160
146
Product Separation Zone
220
148
144
non-PET Separation Zone
208
Polyolefin-Containing Coproduct
140
210
Reaction Zone
142
Reactor Coproduct
138
non-PET Separation Zone
208
112
212
Solvent

Fig. 4.

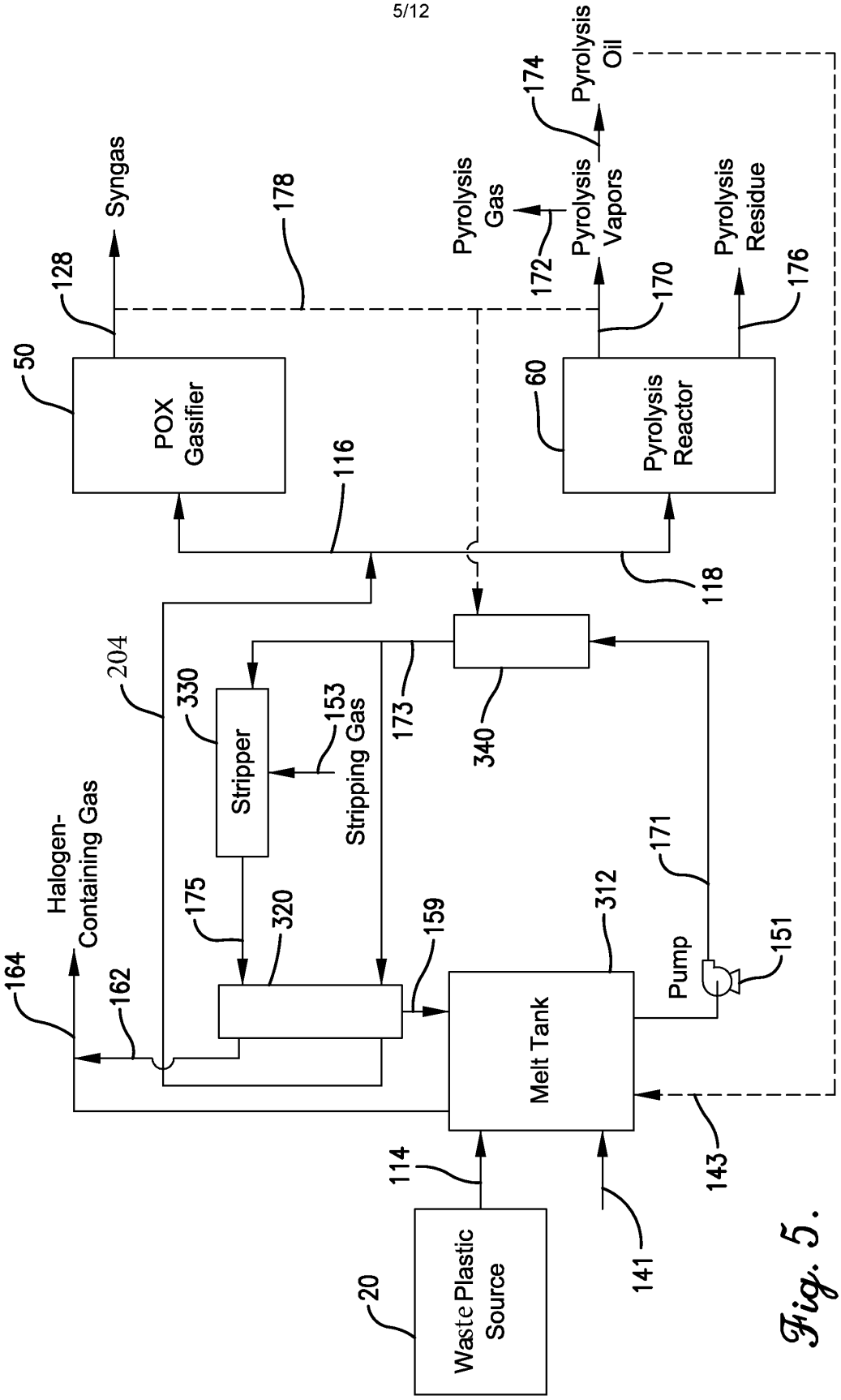
Syngas
128
178
Pyrolysis Gas
172
Pyrolysis Vapors
174
Pyrolysis Oil
Pyrolysis Residue
176
170
50
POX Gasifier
60
Pyrolysis Reactor
116
118
204
330
Stripper
153
Stripping Gas
173
340
Halogen-Containing Gas
164
162
175
320
159
312
171
Pump
151
Melt Tank
143
114
141
20
Waste Plastic Source

Fig. 5.

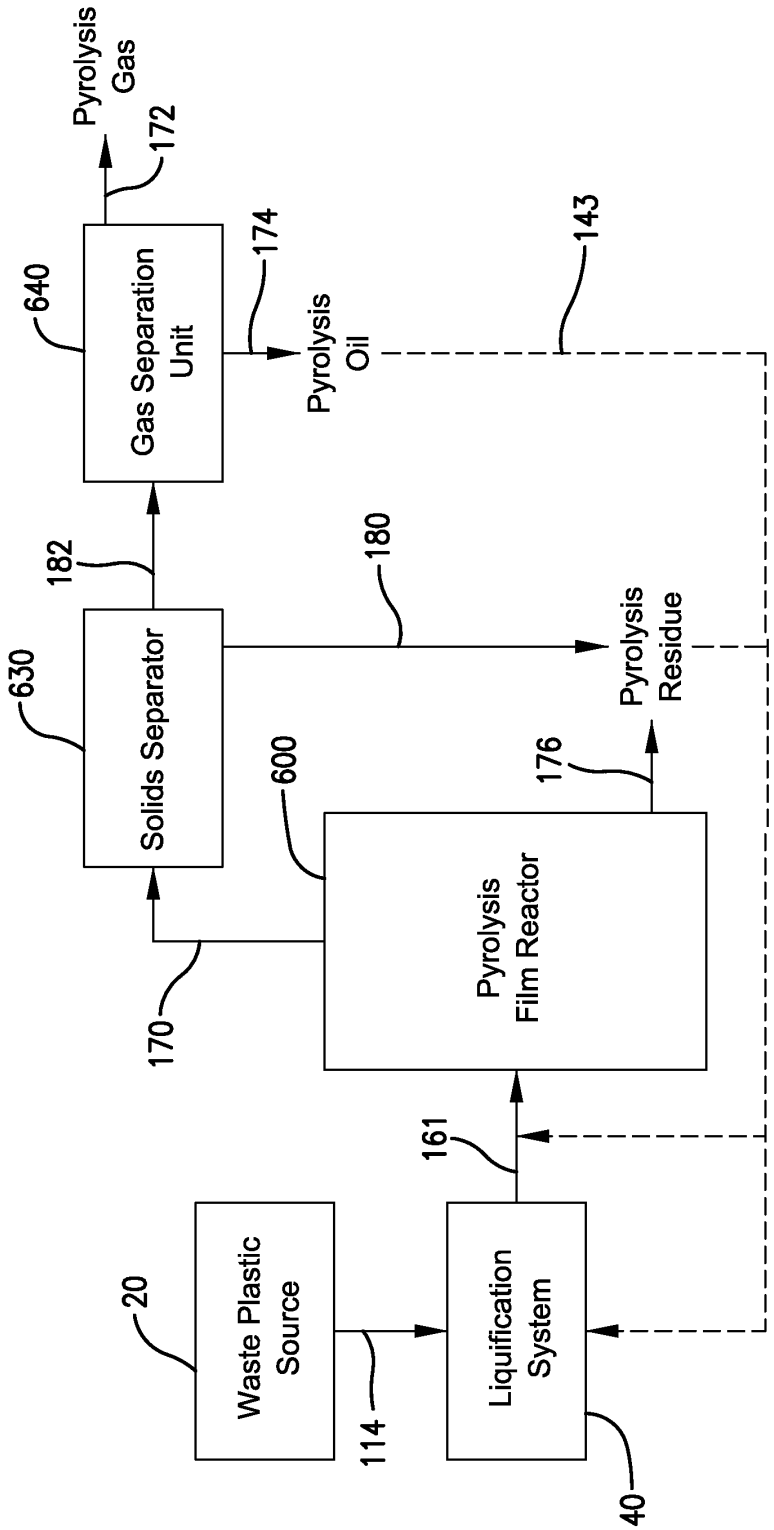
Pyrolysis Gas
172
640
Gas Separation Unit
174
Pyrolysis Oil
143
182
180
630
Solids Separator
Pyrolysis Residue
600
176
Pyrolysis Film Reactor
170
161
20
Waste Plastic Source
Liquification System
114
40

Fig. 6.

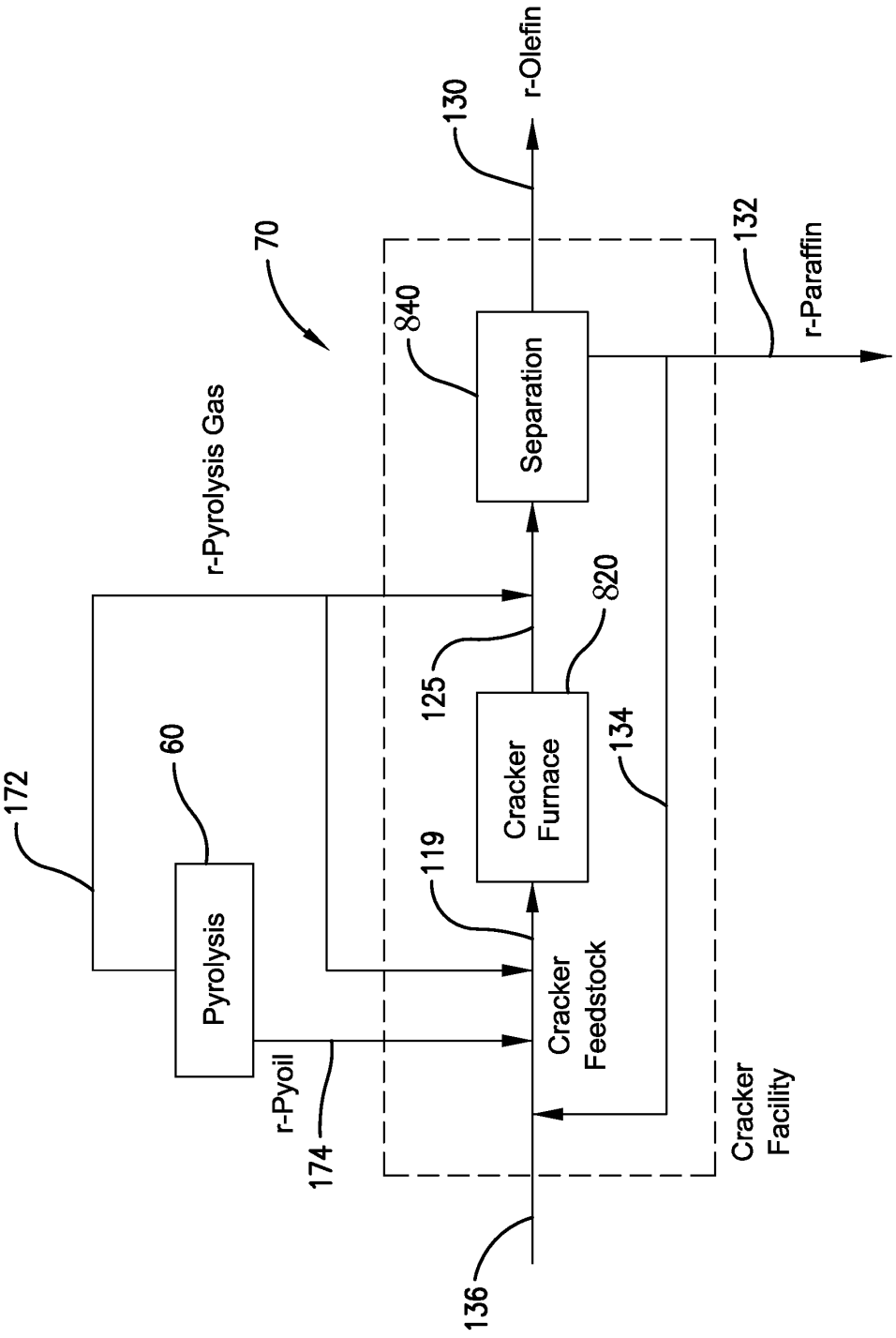
r-Olefin
130
70
132
r-Paraffin
840
Separation
r-Pyrolysis Gas
820
125
Cracker Furnace
134
172
60
119
Pyrolysis
Cracker Feedstock
r-Pyoil
174
Cracker Facility
136

Fig. 7.

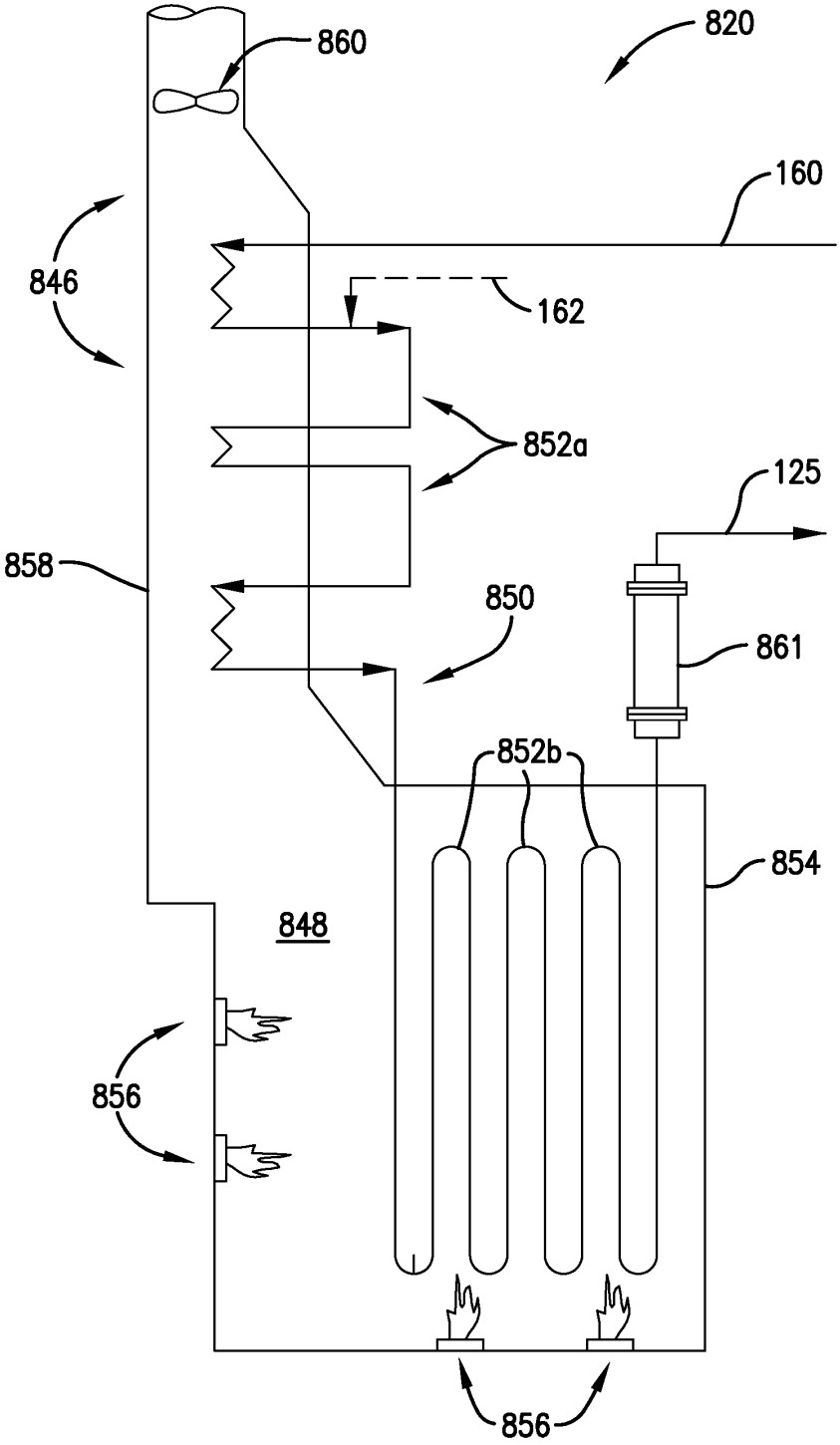

Fig. 8.

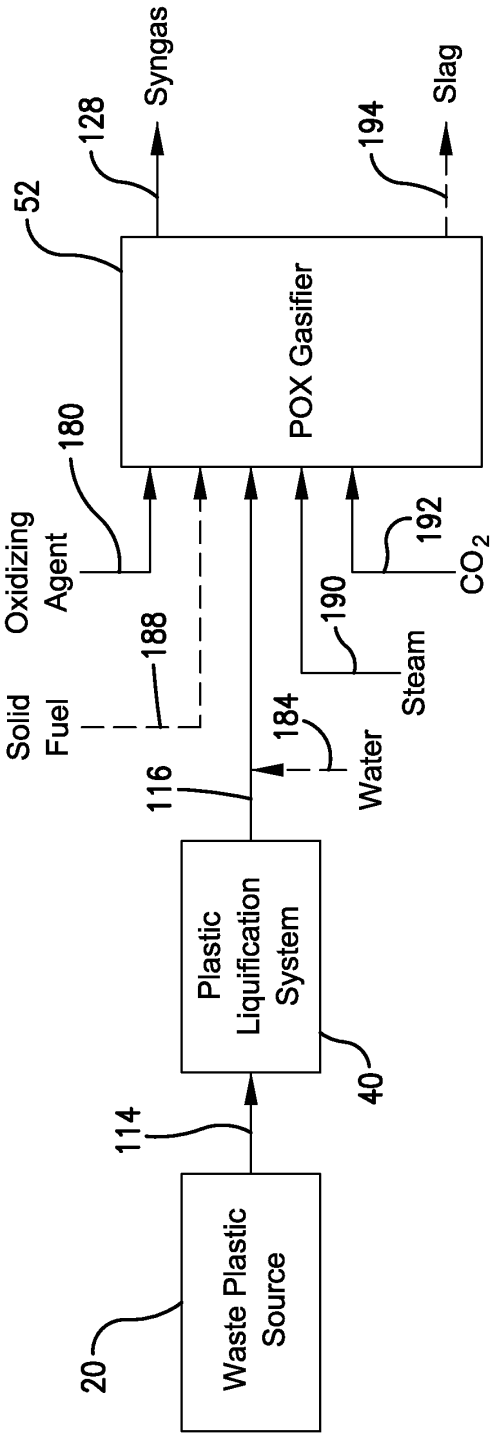
Waste Plastic Source
20
114
Plastic Liquification System
40
116
Solid Fuel
188
Oxidizing Agent
180
Water
184
Steam
190
CO_2
192
POX Gasifier
52
Syngas
128
Slag
194

Fig. 9.

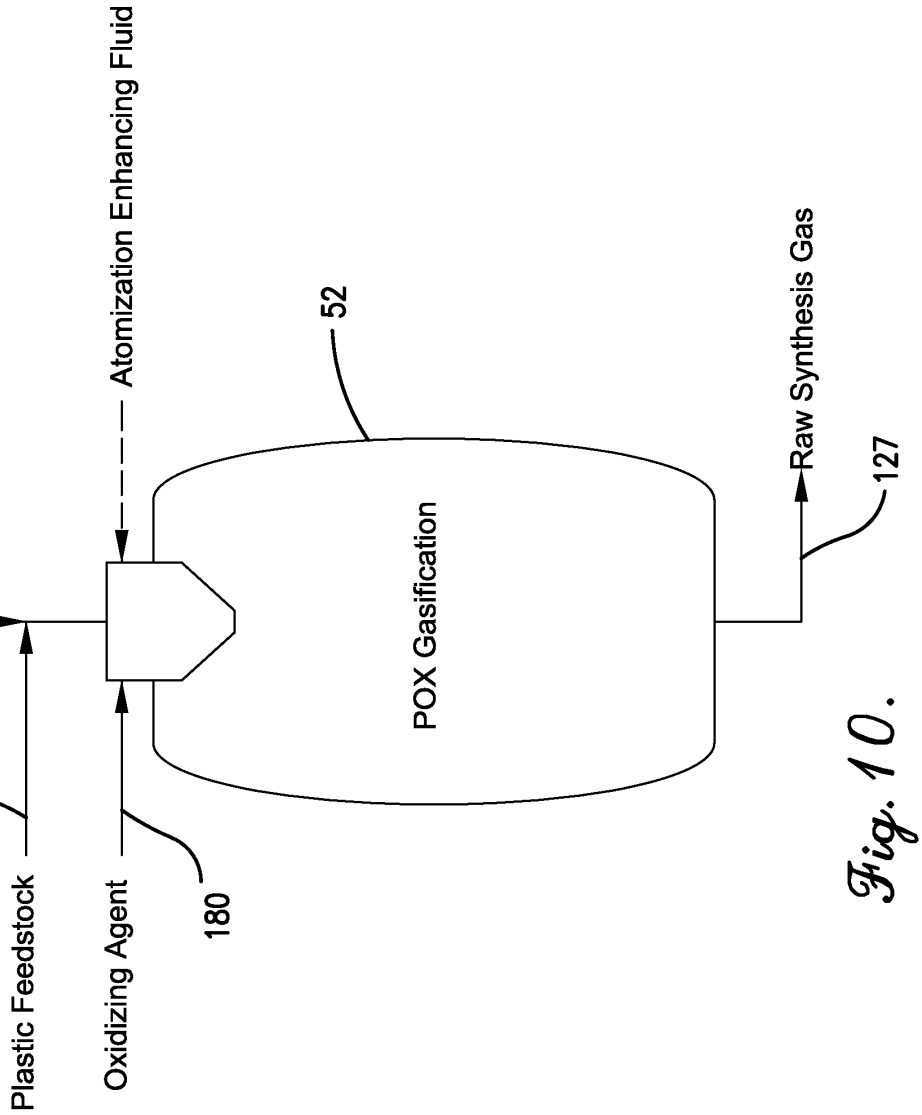
Atomization Enhancing Fluid
Atomization Enhancing Fluid
52
Raw Synthesis Gas
127
POX Gasification
116
Plastic Feedstock
Oxidizing Agent
180

Fig. 10.

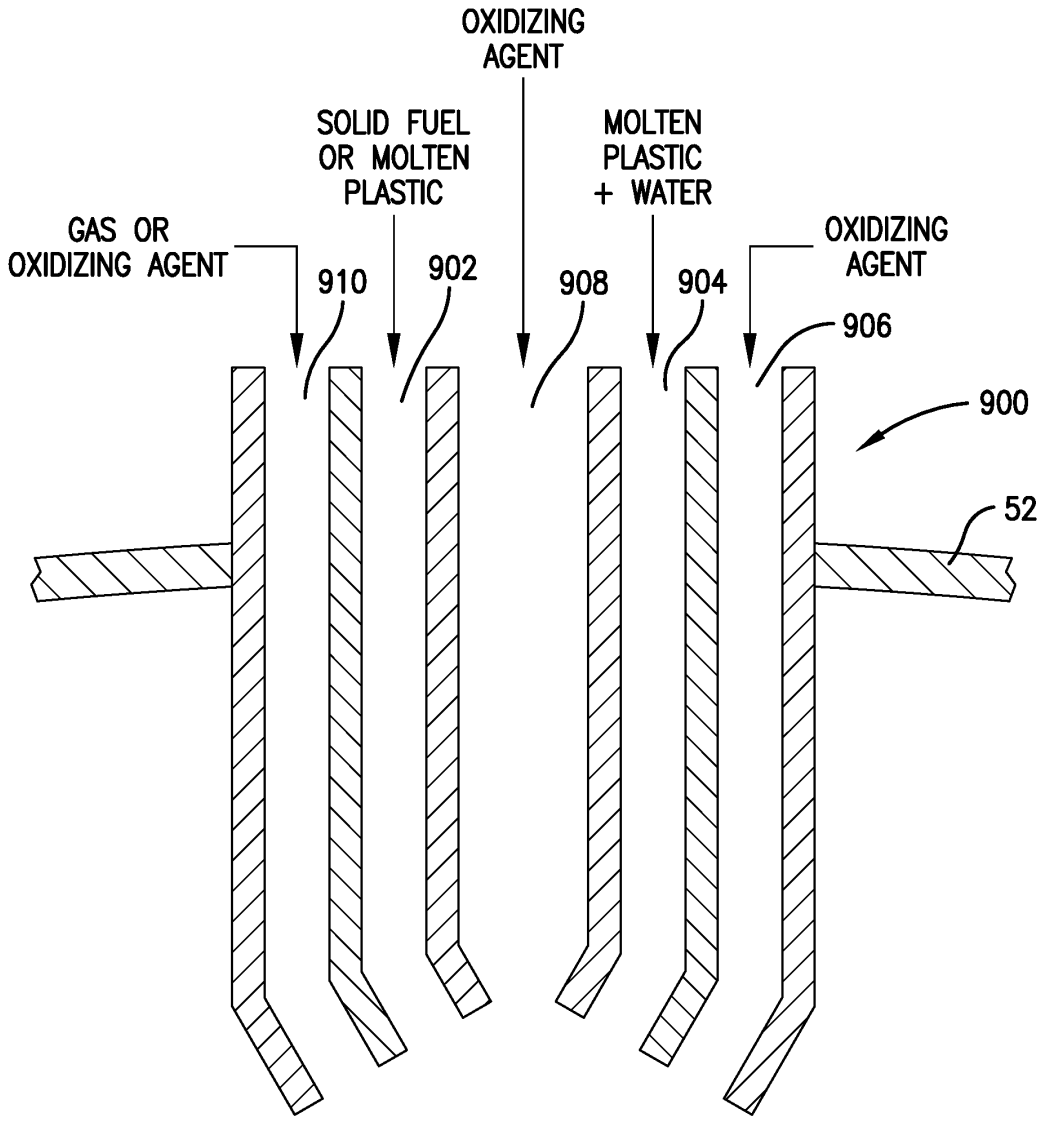
OXIDIZING AGENT
SOLID FUEL OR MOLTEN PLASTIC
MOLTEN PLASTIC + WATER
GAS OR OXIDIZING AGENT
OXIDIZING AGENT
910
902
908
904
906
900
52

Fig. 11.

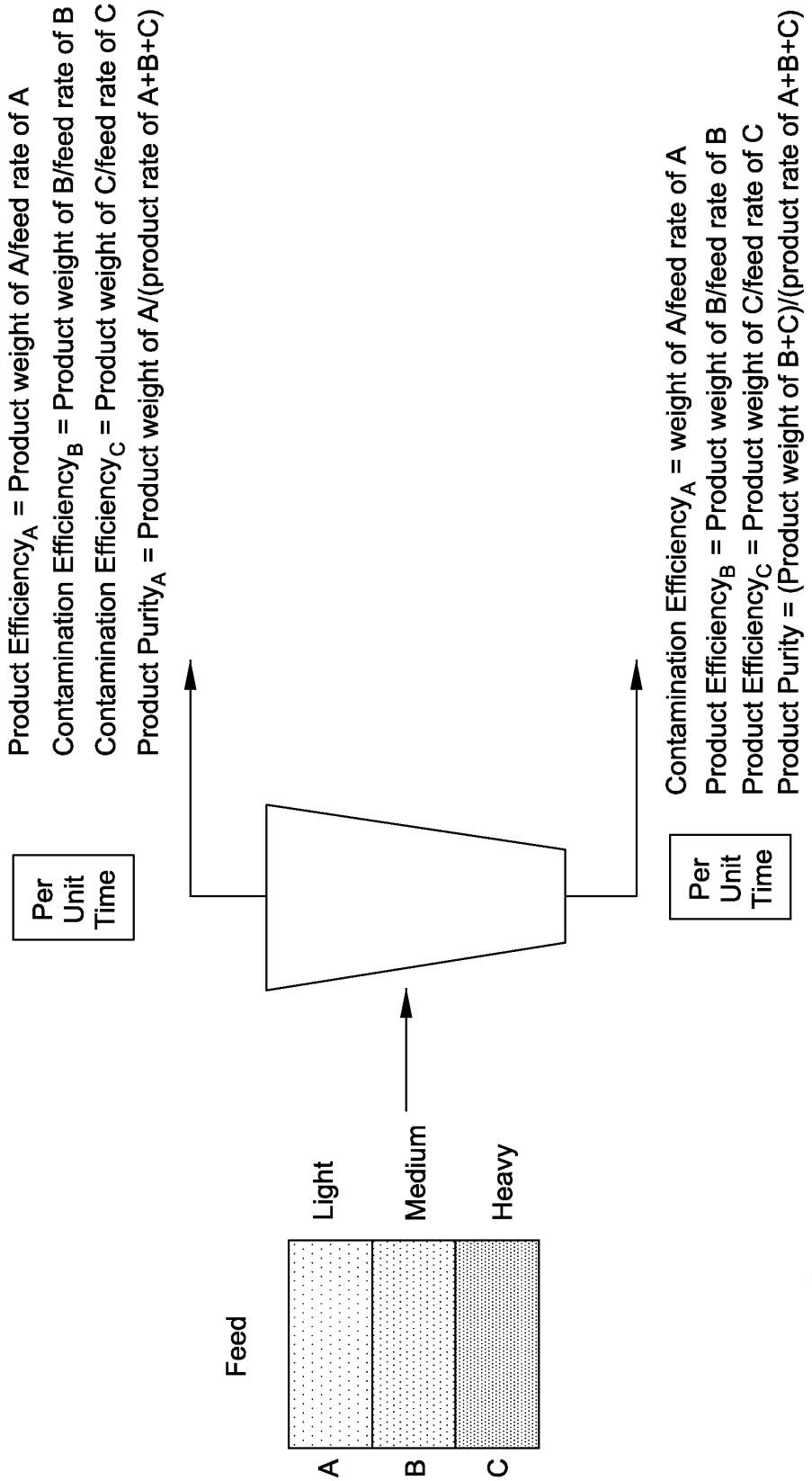
Product Efficiency$_A$ = Product weight of A/feed rate of A
Contamination Efficiency$_B$ = Product weight of B/feed rate of B
Contamination Efficiency$_C$ = Product weight of C/feed rate of C
Product Purity$_A$ = Product weight of A/(product rate of A+B+C)
Per Unit Time
Feed
Light
Medium
Heavy
A
B
C
Contamination Efficiency$_A$ = weight of A/feed rate of A
Product Efficiency$_B$ = Product weight of B/feed rate of B
Product Efficiency$_C$ = Product weight of C/feed rate of C
Product Purity = (Product weight of B+C)/(product rate of A+B+C)
Per Unit Time

Fig. 12.