

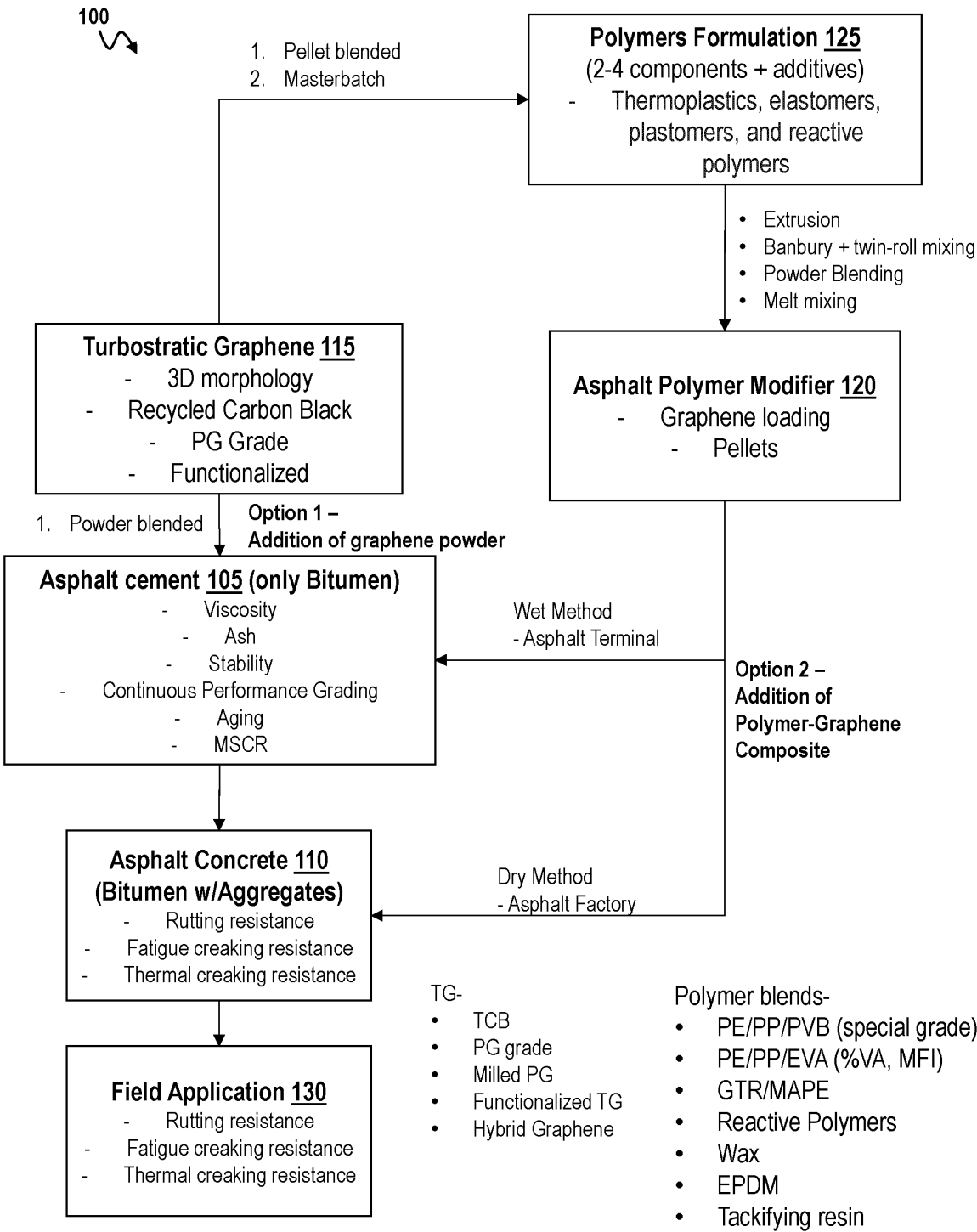


FIG. 1

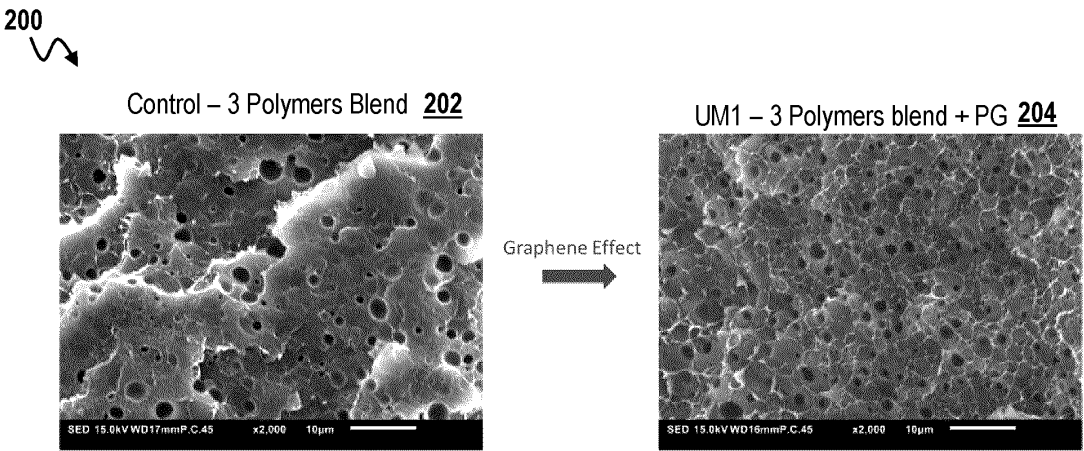


FIG. 2

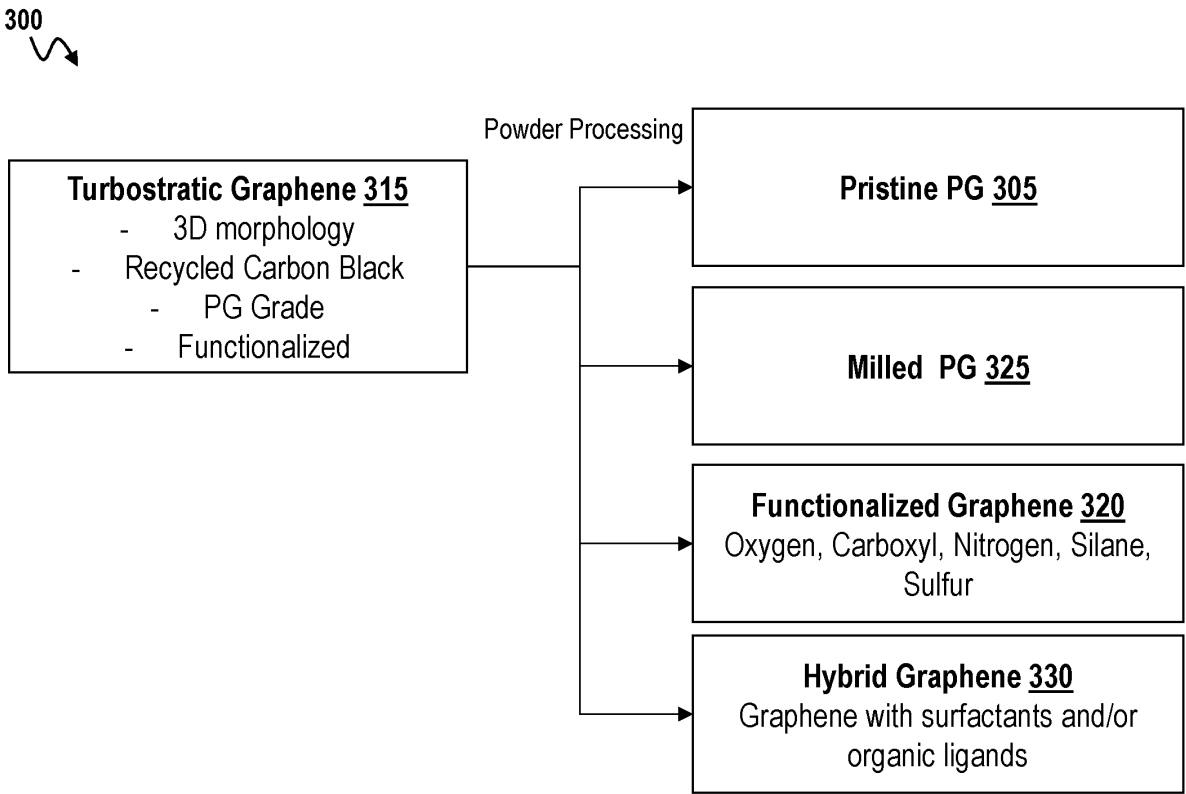


FIG. 3

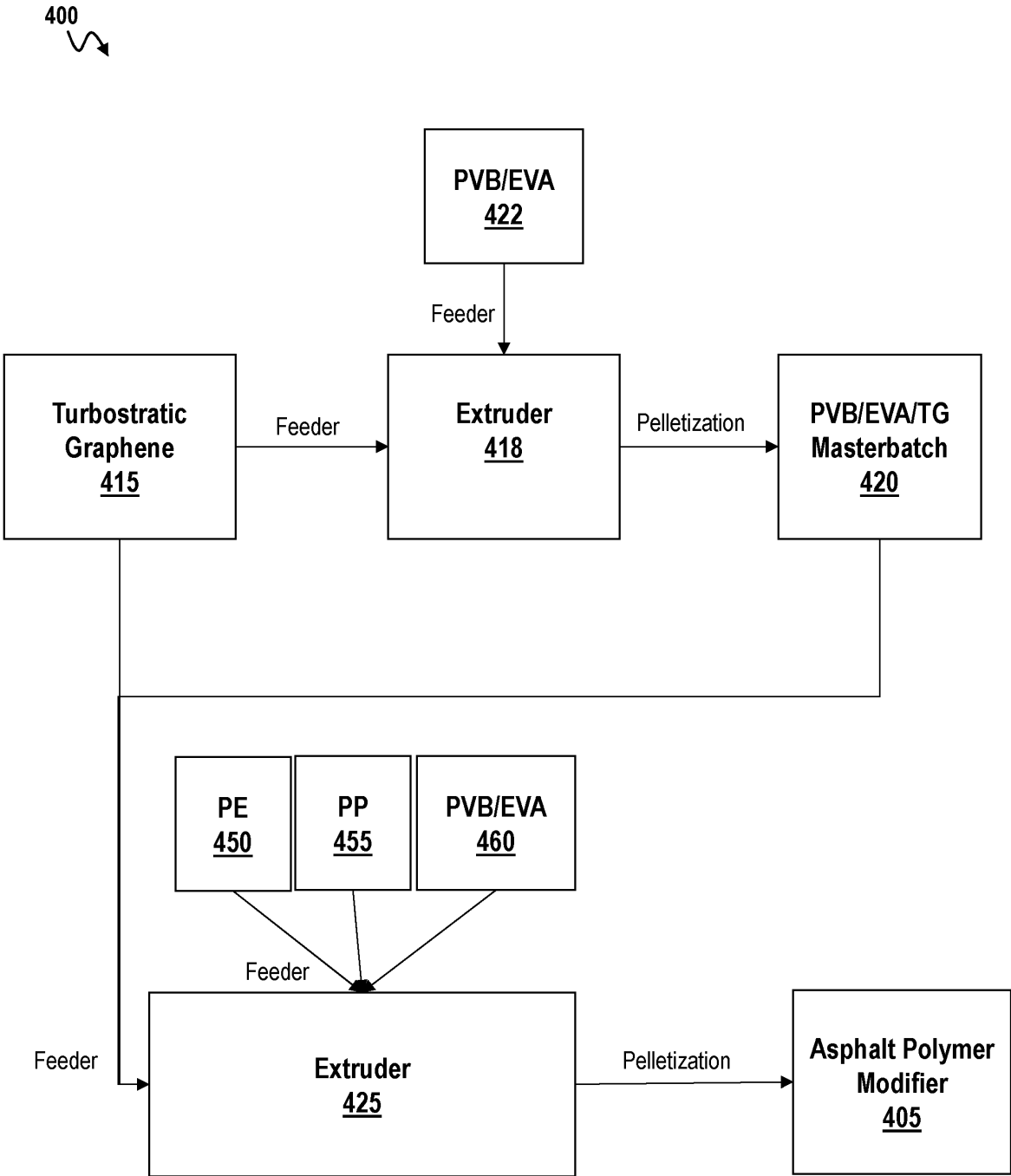


FIG. 4

500
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Blend ID	Example 1	Example 2	Example 3	Example 4
	Control - neat bitumen	Control - standard polymer modified	Powder	Powder
	52-34 XJ	52-34 XJ + 2.5% SBS + 0.25% Crosslink	52-34 XJ + 2% PG1	52-34 XJ + 2% PG2
PG in Bitumen	0%	0%	2%	2%
Ash Content, % MTO LS – 227	0.03	0.03	0.10	0.23
Rotation Viscosity @ 135C, Pas AASHTO T316	0.22	0.56	0.30	0.26
Storage Stability ASTM D7173, AASHTO T315				
Top, G*/sin delta	1.54	3.95	2.71	2.05
Bottom, G*/sin delta	1.57	3.80	2.92	2.13
Storage Stability, DSR difference	0.03	-0.14	0.206	0.07
Continuous Grading ASTM D7643				
Original DSR AASHTO T315				
Predicted Failure Temp @ 2.2kPa, degrees C	55.3	65.1	60.3	57.9
DSR-RTFO AASHTO T315				
Predicted Failure Temp @ 2.2kPa, degrees C	63.4	65.2	59.7	59.2
BBR AASHTO T313				
Low Continuous Grading Temp, degrees C	-35.5	-36.3	-35.3	-34.9
Continuous Grade	55.3-35.5	65.1-36.3	59.7-35.3	57.9-34.9
Actual Grade	52-34	64-34	58-34	58-34

FIG. 5

600


	Example 1	Example 2	Example 5	Example 6	Example 7	Example 8
	Control - neat bitumen	Control - standard polymer modified	Control - Polymer composite (PVB)	Graphene composite - PE/PP/PVB (PVB)	Control - Polymer composite (EVA)	Graphene composite - PE/PP/EVA (EVA)
Blend ID	52-34 XJ	52-34 XJ + 2.5% SBS + 0.25% Crosslink	52-34 XJ + 2.5% PE+PP+PVB	52-34 XJ + 2.5% UM1	PG 52-34 XJ + 2% PE+PP+EVA	PG 52-34 XJ + 2% UM2
Ash Content, %	0.03	0.03	0.11	0.05	0.07	0.05
Rotation Viscosity @ 135C, Pa.s	0.22	0.56	0.49	0.46	0.46	0.49
Storage Stability						
Top, G*/sin delta	1.54	3.95	7.25	4.36	5.33	3.08
Bottom, G*/sin delta	1.57	3.8	3.83	3.54	2.76	3.31
Storage Stability, DSR difference	0.03	-0.14	-3.42	-0.82	-2.56	0.23
DSR						
Predicted Failure Temp @ 2.2kPa, degrees C	55.3	65.1	61.6	76.3	61.2	63.3
DSR-RTFO						
Predicted Failure Temp @ 2.2kPa, degrees C	63.4	65.2	66.2	65.2	63.5	65
BBR						
Low Continuous Grading Temp, degrees C	-35.5	-36.3	-33.8	-35.2	-33.3	-32.7
Continuous Grade	55.3-35.5	65.1-36.3	61.6-33.8	65.2-35.2	61.2-33.3	63.3-32.7
Actual Grade	52-34	64-34	58-28	64-34	58-28	58-28

FIG. 6

700
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	Wet Mix- 2.5%			Dry Mix - 5 %		Dry Mix - 3.5%
	Example 9	Example 10	Example 11	Example 12	Example 13	Example 14
	Control	UM1	UM2	UM1	UM2	UM2
Flexibility Index	10.1	12.9	14	13.3	10.9	14.7
percent of change from control value	---	27.72%	38.61%	31.68%	7.92%	45.54%
Fracture Energy, J/m ²	560.8	564.8	543.5	586	533	674
percent of change from control value	---	0.71%	-3.08%	4.49%	-4.96%	20.19%
Passes at 12.5 mm rut depth	8982	9622	16398	14332	15298	9888
percent of change from control value	---	7.13%	82.57%	59.56%	70.32%	10.09%

FIG. 7