WHAT IS CLAIMED IS:

1. A method for reducing wear in an internal combustion engine comprising operating the internal combustion engine with an internal combustion engine lubricating oil composition comprising:

a. a major amount of an oil of lubricating viscosity;

b. a dispersant-type olefin copolymer viscosity index improver; and

c. 0.5 to 5 wt.%, based on the total weight of the lubricating oil composition, of a secondary hydrocarbylamine compound, a tertiary hydrocarbylamine compound, or combinations thereof;

wherein the dispersant-type olefin copolymer viscosity index improver comprises the reaction product of:

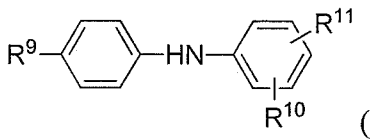
i. a hydrocarbon polymer grafted with an ethylenically unsaturated acylating agent, wherein the hydrocarbon polymer has a number average molecular weight (Mn) between about 7,000 and about 500,000;

ii. an aryloxy-alkylene amine of the formula Ar-O-Alk-NH_2, wherein Ar is an aromatic moiety selected from benzene, naphthylene or anthracene or optionally substituted benzene, optionally substituted naphthylene or optionally substituted anthracene, wherein the optionally substituted groups are selected from 1 to 3 substituent groups selected from alkyl, alkenyl, alkoxy, aryl, alkaryl, arylalkyl, aryloxy, wherein the alkyl group is a straight or branched chain carbon having 6 or less carbon atoms; and -Alk- comprises straight and branched chain alkylene groups having 1 to 10 carbon atoms, which may optionally be substituted with a group consisting of phenyl and benzyl;

or an aryl amine;

wherein the aryl amine is selected from the group consisting of:

a. an N-arylphenylenediamine represented by the formula (1):

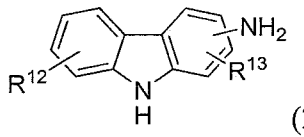


(1),

wherein R^9 is H, --NHaryl, -NHalkaryl, or a branched or straight chain hydrocarbyl radical having from about 4 to about 24 carbon atoms selected from alkyl, alkenyl, alkoxyl, aralkyl or alkaryl; R^{10} is --NH_2, --$(NH(CH_2)_n)_mNH_2$, --NHalkyl, --NHaralkyl, --CH_2 --aryl--NH_2, in which n and m each independently

have a value from about 1 to about 10; and R^{11} is hydrogen, alkyl, alkenyl, alkoxyl, aralkyl, or alkaryl, having from about 4 to about 24 carbon atoms;

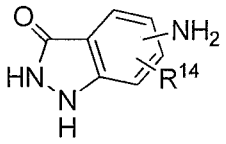
b. an aminocarbazole represented by the formula (2):



(2),

wherein R12 and R13 each independently represent hydrogen or an alkyl or alkenyl radical having from about 1 to about 14 carbon atoms;

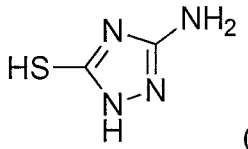
c. an amino-indazolinone represented by the formula (3):



(3),

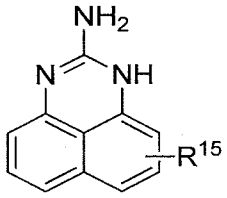
wherein R^{14} is hydrogen or an alkyl radical having from about 1 to about 14 carbon atoms;

d. an aminomercaptotriazole represented by the formula (4):



(4),

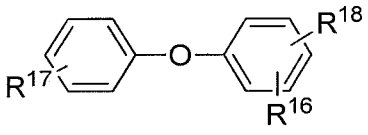
e. an aminoperimidine represented by the formula (5):



(5),

wherein R^{15} represents hydrogen or an alkyl radical having from about 1 to about 14 carbon atoms;

f. an aryloxyphenyleneamine represented by the formula (6):

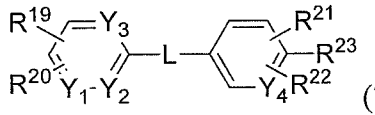


(6),

wherein R^{16} is H, --NHaryl, -NHalkaryl, or branched or straight chain radical having from about 4 to about 24 carbon atoms that can be alkyl, alkenyl, alkoxyl, aralkyl or alkaryl; R^{17} is $--NH_2$, $--(NH(CH_2)_n)_m NH_2$, --NHalkyl, or --NHaralkyl, in which n and m each independently have a value from about 1 to

about 10; and R^{18} is hydrogen, alkyl, alkenyl, alkoxyl, aralkyl, or alkaryl, having from about 4 to about 24 carbon atoms;

g. an aromatic amine comprising two aromatic groups, linked by a group, L, represented by the following formula (7):

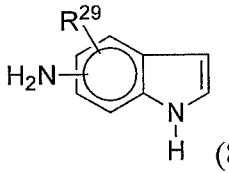


(7),

wherein L is selected from –O-, -N=N-, -NH-, $-CH_2NH$, $-C(O)NR^{24}$-, -C(O)O-, $-SO_2$-, $-SO_2NR^{25}$- or $–SO_2NH$-, wherein R^{24} and R^{25} independently represent a hydrogen, an alkyl, an alkenyl or an alkoxy group having from about 1 to about 8 carbon atoms; wherein each Y_1, Y_2, Y_3 and Y_4 are independently N or CH provided that Y_1 and Y_2 may not both be N; R^{19} and R^{20} independently represent a hydrogen, alkyl, aryl, alkaryl, aralkyl, alkoxy, hydroxyalkyl, aminoalkyl, -OH, $-NO_2$, $-SO_3H$, $-SO_3Na$, CO_2H or salt thereof, $-NR^{26}R^{27}$ wherein R^{26} and R^{27} are independently hydrogen, alkyl, aryl, arylalkyl, or alkaryl, R^{21} and R^{22} independently represent a hydrogen, an alkyl, an alkenyl or an alkoxy group having from about 1 to about 8 carbon atoms, -OH, $-SO_3H$ or $-SO_3Na$, R^{23} represents $–NH_2$, $-NHR^{28}$, wherein R^{28} is an alkyl or an alkenyl group having from about 1 to about 8 carbon atoms, $-CH_2-(CH_2)_n–NH_2$ or $–CH_2$-aryl-NH_2 and n is from 0 to about 10;

h. an aminothiazole selected from the group consisting of aminothiazole, aminobenzothiazole, aminobenzothiadiazole and aminoalkylthiazole;

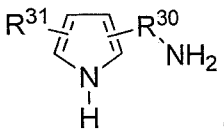
i. an aminoindole represented by the formula (8):



(8),

wherein R^{29} represents a hydrogen, an alkyl or an alkenyl group having from about 1 to about 14 carbon atoms;

j. an aminopyrrole represented by the formula (9):



(9),

wherein R^{30} represents a divalent alkylene group having about 2 to about 6 carbon atoms, and R^{31} represents a hydrogen, an alkyl or an alkenyl group having from about 1 to about 14 carbon atoms;

k. a ring substituted or unsubstituted aniline;

l. an aminoquinoline;

m. an aminobenzimidazole;

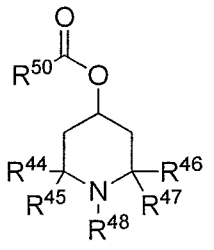
n. a N,N-dialkylphenylenediamine;

o. a benzylic amine;

p. a napthylamine; and

q. an aminoanthracene;

wherein the secondary hydrocarbylamine compound is a sterically hindered amine compound represented by a structure of formula (I):



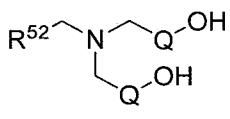
(I),

wherein R^{44}, R^{45}, R^{46}, R^{47}, and R^{48} are each independently a hydrocarbyl group having from 1 to 12 carbon atoms, R^{48} is a hydrogen atom, and R^{50} is a hydrocarbyl group having from 1 to 25 carbon atoms; and

wherein the tertiary hydrocarbylamine compound is a compound repesented by the structure of formula (II):

$$R^{34}R^{35}R^{36}N \qquad \text{(II)},$$

wherein at least one of R^{34}, R^{35}, and R^{36} is a C1-C6 hydrocarbyl group and the other two R^{34}, R^{35} and R^{36} are a C_8-C_{20} hydrocarbyl group; or an alkyl di-alkanolamine having the following formula (III):



(III),

wherein R^{52} has from 6 to 22 carbon atoms; and where Q is a C_1 to C_4 linear or branched alkylene group.

2. The method of claim 1, wherein [c] of the internal combustion engine lubricating oil composition has a weight average molecular weight of from 100 to 1200.

3. The method of claim 1, wherein the [c] of the internal combustion engine lubricating oil composition has a TBN value of from 20 to 500 when tested according to ASTM D2896.

4. The method of claim 1, wherein the tertiary hydrocarbylamine compound of the internal combustion engine lubricating oil composition is a compound having the following formula (11):

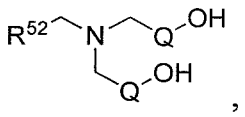
$$R^{34}R^{35}R^{36}N \qquad (11),$$

wherein at least one of R^{34}, R^{35}, and R^{36} is a C1-C3 hydrocarbyl group and the other two R34, R35, and R36 are a C12-C20 hydrocarbyl group.

5. The method of claim 4, wherein, the tertiary amine is selected from the group consisting of: dicocoylmethylamine, and ditallowmethylamine.

6. The method of claim 1, wherein the tertiary hydrocarbylamine compound of the internal combustion engine lubricating oil composition is an alkoxylated amine.

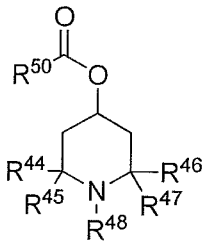
7. The method of claim 1, wherein the tertiary hydrocarbylamine compound of the internal combustion engine lubricating oil composition is the compound having the following formula :



,

wherein R^{52} has from 8 to 18 carbon atoms; and where Q is a C_1 to C_4 linear or branched alkylene group.

8. The method of claim 1, wherein the hindered secondary hydrocarbylamine compound of the internal combustion engine lubricating oil composition has the following formula :



,

R^{44}, R^{45}, R^{46}, R^{47}, and R^{48} are each independently a hydrocarbyl group having from 1 to 6 carbon atoms, and R^{50} is an unsaturated C12-21 hydrocarbyl group.

9. The method of claim 1, wherein the engine wear is cam wear.

10. The method of claim 1, wherein the cam wear is measured according to the Cummins® ISB engine test (ASTM D7484-11).

11. The method of claim 1, wherein the internal combustion engine lubricating oil composition further comprises 1 to 3 wt.% based on the total weight of the lubricating oil composition, of component (C).

12. The method of claim 1, wherein the internal combustion engine lubricating oil composition further comprises one or more additives selected from the group consisting of an antioxidant, anti-wear agent, detergent, rust inhibitor, dehazing agent, demulsifying agent, metal deactivating agent, friction modifier, pour point depressant, antifoaming agent, co-solvent, corrosion inhibitor, ashless dispersant, multifunctional agent, dye, extreme pressure agent, and mixtures thereof.

13. A method for reducing wear in an internal combustion engine comprising operating the internal combustion engine with an internal combustion engine lubricating oil composition comprising:

(A) a major amount of an oil of lubricating viscosity;

(B) 0.10 to 5 wt. %, based on the total weight of the lubricating oil composition, of a dispersant-type olefin copolymer viscosity index improver; and

a. 0.5 to 5 wt.%, based on the total weight of the lubricating oil composition, of a secondary hydrocarbylamine compound, a tertiary hydrocarbylamine compound, or combinations thereof;

wherein the dispersant-type olefin copolymer viscosity index improver comprises the reaction product of:

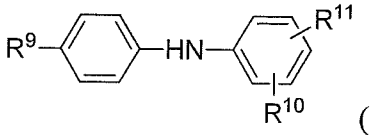
i. a hydrocarbon polymer grafted with an ethylenically unsaturated acylating agent, wherein the hydrocarbon polymer has a number average molecular weight (Mn) between about 7,000 and about 500,000;

ii. an aryloxy-alkylene amine of the formula Ar-O-Alk-NH_2, wherein Ar is an aromatic moiety selected from benzene, naphthylene or anthracene or optionally substituted benzene, optionally substituted naphthylene or optionally substituted anthracene, wherein the optionally substituted groups are selected from 1 to 3 substituent groups selected from alkyl, alkenyl, alkoxy, aryl, alkaryl, arylalkyl, aryloxy, wherein the alkyl group is a straight or branched chain carbon having 6 or less carbon atoms; and -Alk- comprises straight and branched chain alkylene groups having 1 to 10 carbon atoms, which may optionally be substituted with a group consisting of phenyl and benzyl;

or an aryl amine;

wherein the aryl amine is selected from the group consisting of:

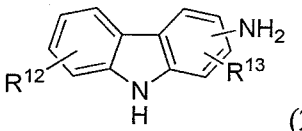
a. an N-arylphenylenediamine represented by the formula (1):



(1),

wherein R^9 is H, --NHaryl, -NHalkaryl, or a branched or straight chain hydrocarbyl radical having from about 4 to about 24 carbon atoms selected from alkyl, alkenyl, alkoxyl, aralkyl or alkaryl; R^{10} is --NH_2, --$(NH(CH_2)_n)_mNH_2$, --NHalkyl, --NHaralkyl, --CH_2 --aryl--NH_2, in which n and m each independently have a value from about 1 to about 10; and R^{11} is hydrogen, alkyl, alkenyl, alkoxyl, aralkyl, or alkaryl, having from about 4 to about 24 carbon atoms;

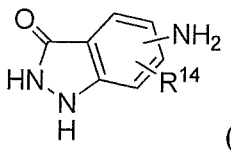
b. an aminocarbazole represented by the formula (2):



(2),

wherein R^{12} and R^{13} each independently represent hydrogen or an alkyl or alkenyl radical having from about 1 to about 14 carbon atoms;

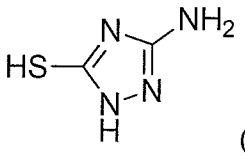
c. an amino-indazolinone represented by the formula (3):



(3),

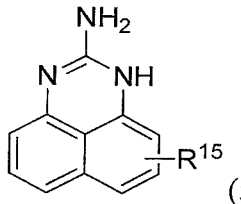
wherein R^{14} is hydrogen or an alkyl radical having from about 1 to about 14 carbon atoms;

d. an aminomercaptotriazole represented by the formula (4):



(4),

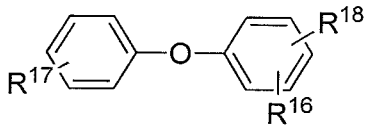
e. an aminoperimidine represented by the formula (5):



(5),

wherein R^{15} represents hydrogen or an alkyl radical having from about 1 to about 14 carbon atoms;

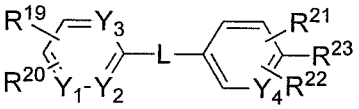
f. an aryloxyphenyleneamine represented by the formula (6):



(6),

wherein R^{16} is H, --NHaryl, -NHalkaryl, or branched or straight chain radical having from about 4 to about 24 carbon atoms that can be alkyl, alkenyl, alkoxyl, aralkyl or alkaryl; R^{17} is $--NH_2$, $--(NH(CH_2)_n)_m NH_2$, --NHalkyl, or --NHaralkyl, in which n and m each independently have a value from about 1 to about 10; and R^{18} is hydrogen, alkyl, alkenyl, alkoxyl, aralkyl, or alkaryl, having from about 4 to about 24 carbon atoms;

g. an aromatic amine comprising two aromatic groups, linked by a group, L, represented by the following formula (7):



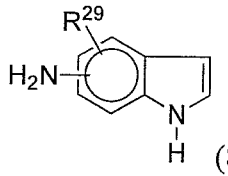
(7),

wherein L is selected from –O-, -N=N-, -NH-, $-CH_2NH$, $-C(O)NR^{24}$-, -C(O)O-, $-SO_2$-, $-SO_2NR^{25}$- or $–SO_2NH$-, wherein R^{24} and R^{25} independently represent a hydrogen, an alkyl, an alkenyl or an alkoxy group having from about 1 to about 8 carbon atoms; wherein each Y_1, Y_2, Y_3 and Y_4 are independently N or CH provided that Y_1 and Y_2 may not both be N; R^{19} and R^{20} independently represent a hydrogen, alkyl, aryl, alkaryl, aralkyl, alkoxy, hydroxyalkyl, aminoalkyl, -OH,

$-NO_2$, $-SO_3H$, $-SO_3Na$, CO_2H or salt thereof, $-NR^{26}R^{27}$ wherein R^{26} and R^{27} are independently hydrogen, alkyl, aryl, arylalkyl, or alkaryl, R^{21} and R^{22} independently represent a hydrogen, an alkyl, an alkenyl or an alkoxy group having from about 1 to about 8 carbon atoms, -OH, $-SO_3H$ or $-SO_3Na$, R^{23} represents $-NH_2$, $-NHR^{28}$, wherein R^{28} is an alkyl or an alkenyl group having from about 1 to about 8 carbon atoms, $-CH_2-(CH_2)_n-NH_2$ or $-CH_2$-aryl-NH_2 and n is from 0 to about 10;

h. an aminothiazole selected from the group consisting of aminothiazole, aminobenzothiazole, aminobenzothiadiazole and aminoalkylthiazole;

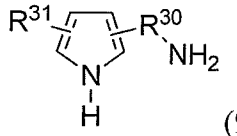
i. an aminoindole represented by the formula (8):



(8),

wherein R^{29} represents a hydrogen, an alkyl or an alkenyl group having from about 1 to about 14 carbon atoms;

j. an aminopyrrole represented by the formula (9):



(9),

wherein R^{30} represents a divalent alkylene group having about 2 to about 6 carbon atoms, and R^{31} represents a hydrogen, an alkyl or an alkenyl group having from about 1 to about 14 carbon atoms;

k. a ring substituted or unsubstituted aniline;

l. an aminoquinoline;

m. an aminobenzimidazole;

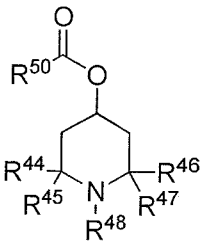
n. a N,N-dialkylphenylenediamine;

o. a benzylic amine;

p. a napthylamine; and

q. an aminoanthracene;

wherein the secondary hydrocarbylamine compound is a sterically hindered amine compound represented by a structure of formula (I):



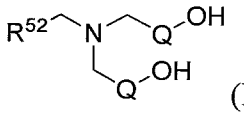
(I),

wherein R^{44}, R^{45}, R^{46}, R^{47}, and R^{48} are each independently a hydrocarbyl group having from 1 to 12 carbon atoms, R^{48} is a hydrogen atom, and R^{50} is a hydrocarbyl group having from 1 to 25 carbon atoms; and

wherein the tertiary hydrocarbylamine compound is a compound repesented by the structure of formula (II):

$$R^{34}R^{35}R^{36}N \qquad \text{(II)},$$

wherein at least one of R^{34}, R^{35}, and R^{36} is a C1-C6 hydrocarbyl group and the other two R^{34}, R^{35} and R^{36} are a C_8-C_{20} hydrocarbyl group; or an alkyl di-alkanolamine having the following formula (III):



(III),

wherein R^{52} has from 6 to 22 carbon atoms; and where Q is a C_1 to C_4 linear or branched alkylene group.

14. The method of claim 13, wherein component (C) of the internal combustion engine lubricating oil composition is the tertiary hydrocarbylamine compound.

15. The method of claim 13, wherein the internal combustion engine lubricating oil composition further comprises one or more additives selected from the group consisting of an antioxidant, anti-wear agent, detergent, rust inhibitor, dehazing agent, demulsifying agent, metal deactivating agent, friction modifier, pour point depressant, antifoaming agent, co-solvent, corrosion inhibitor, ashless dispersant, multifunctional agent, dye, extreme pressure agent, and mixtures thereof.

16. The method of claim 13, wherein the internal combustion engine lubricating oil composition further comprises 1 to 3 wt.% based on the total weight of the lubricating oil composition, of component (C).