CLAIMS

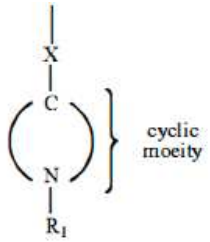
We claim:

1) A flowable composition lacking a detersive component ~~comprising~~ consisting essentially of a) at least 2.5%, by weight, of a polysiloxane fluid component comprising:

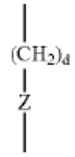
~~a) a polysiloxane component comprising~~ a plurality of hindered amine side chains, and

b) a silicone-compatible, volatile liquid carrier component

wherein said hindered amine side chains have the general formula, pendant from an Si atom in the polysiloxane side chain:



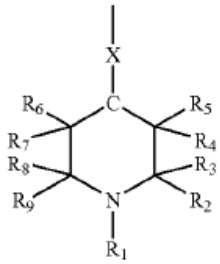
wherein R_1 is an H, OH, or a C_1-C_5 hydrocarbon; X is a C_1-C_{10} hydrocarbon, a heteroatom or



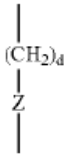
wherein Z is a heteroatom and d is 0 to ~~about~~ 6; preferably wherein the cyclic moiety comprises a piperidinyl or pyrrolidinyl moiety; preferably wherein said polysiloxane fluid component comprises a propoxytetramethyl piperidinyl dimethicone component, and

wherein said flowable composition provides at least an 80% reduction in hair frizz when frizzy hair is contacted with the flowable composition and subsequently maintained at 80° F and 80% humidity for 6 hours, as compared to frizzy hair otherwise identically treated but not contacted with the flowable composition, and wherein reduction in hair frizz is measured by digital image analysis of said frizzy hair contacted with the flowable composition and said frizzy hair not contacted with the flowable composition at the end of said 6 hour time period.

2) The composition of claim 1 wherein said plurality of side chains has the following structure:



wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 are independently an H, a C_1-C_{10} hydrocarbon, an ester, carboxyl or a halogen, and X is a C_1-C_{10} hydrocarbon, a heteroatom, or



wherein Z is a heteroatom and d is 0 to about 6, preferably wherein the cyclic moiety comprises a piperidinyl or pyrrolidinyl moiety; preferably wherein said polysiloxane fluid component comprises a propoxytetramethyl piperidinyl dimethicone component.

3) The composition of any preceding claim which further comprises:

c) an alkylsiloxysilicate component; preferably wherein the alkylsiloxysilicate component comprises a compound selected from the group consisting of a trimethylsiloxysilicate component, a phenylpropyldimethylsiloxysilicate component, and mixtures thereof; or wherein the alkylsiloxysilicate component comprises a trimethylsiloxysilicate component; preferably wherein said trimethylsiloxysilicate component iscomprised in a trimethylsiloxysilicate-based resin silicone polymer.

4) The composition according to any preceding claim wherein the silicone-compatible, volatile liquid carrier comprises a component selected from the group consisting of: a volatile siloxy component; a volatile hydrocarbon; and a volatile alcohol~~; preferably wherein the volatile siloxy component comprises a low molecular weight component selected from one or more of: a dimethicone, a dimethiconol, a phenyl methicone, a phenyl methiconol, a phenyl trimethicone, a diphenyl dimethicone, a phenyl dimethicone, a diphenylsiloxy phenyl trimethicone, a hexamethylsiloxane, a disiloxane, a trisiloxane, cyclotetrasiloxane, cyclopentasiloxane, cyclohexasiloxane~~.

5) The composition according to any preceding claim which further comprises:

(d) a non-volatile component comprising a component selected from the group

consisting of a dimethicone component, a dimethiconol component and a phenyl silicone component.

6) The composition according to any preceding claim which further comprises one or more components selected from the group consisting of a colorant component, a hair shine ingredient, a sunscreen ingredient, an aesthetic modifier component, an essential oil component, a botanical component, a scent component, a nucleic acid component, a specialty extract component and a vitamin; preferably wherein the aesthetic modifier component is selected from the group consisting of a thickener component, a preservative component, a fragrance component, a pH adjustment component, a plasticizer component, an appearance modifier, and an anti-oxidant component.

7) The composition of any preceding claim wherein

a) said polysiloxane component comprises a propoxytetramethyl piperidinyl dimethicone component, and
b) said silicone-compatible, volatile liquid carrier component comprises a volatile component selected from the group consisting of a dimethicone, a dimethiconol, a phenyl methicone, a phenyl methiconol, a phenyl trimethicone, a diphenyl dimethicone, a phenyl dimethicone, and a diphenylsiloxy phenyl trimethicone, a hexamethylsiloxane, a disiloxane, a trisiloxane, cyclotetrasiloxane, cyclopentasiloxane, cyclohexasiloxane, and a mixture of two or more of these components.

8) The composition of any preceding claim wherein the composition is anhydrous.

~~9) The composition according to any preceding claim which, when applied to frizzy hair and permitted to dry, causes a reduction in hair frizz at 80° F and 80% humidity relative to untreated frizzy hair under the same temperature and humidity conditions; preferably wherein the reduction in hair frizz of tresses treated with said composition is at least 80% relative to untreated frizzy hair under the same temperature and humidity conditions.~~

~~10~~ 9) A method of reducing or preventing hair frizz, comprising the steps:

I) applying to hair a flowable composition lacking a detersive component ~~comprising~~ consisting essentially of a) at least 2.5%, by weight, of a polysiloxane fluid component comprising~~:~~

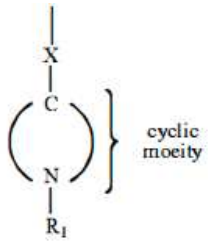
~~a) a polysiloxane component comprising~~ a plurality of hindered amine

side chains, and

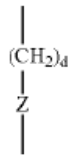
b) a silicone-compatible, volatile liquid carrier component; and

II) distributing said composition along a plurality of hair shafts;

wherein said hindered amine side chains have the general formula, pendant from an Si atom in the polysiloxane side chain:



wherein R_1 is an H, OH, or a C_1-C_5 hydrocarbon; X is a C_1-C_{10} hydrocarbon, a heteroatom or



wherein Z is a heteroatom and d is 0 to ~~about~~ 6; preferably wherein the cyclic moiety comprises a piperidinyl or pyrrolidinyl moiety; preferably wherein said polysiloxane fluid component comprises a propoxytetramethyl piperidinyl dimethicone component, and

wherein said method provides at least an 80% reduction in hair frizz when frizzy hair is contacted with the flowable composition and subsequently maintained at 80° F and 80% humidity for 6 hours, as compared to frizzy hair otherwise identically treated but not contacted with the flowable composition, and wherein reduction in hair frizz is measured by digital image analysis of said frizzy hair contacted with the flowable composition and said frizzy hair not contacted with the flowable composition at the end of said 6 hour time period.

~~11~~ 10)A method of reducing or preventing hair frizz, according to claim ~~10~~ 9 comprising the steps:

I) applying to hair a flowable composition comprising the composition of any of claims 1, 3, and 5 to 8 ~~5 to 12~~, and

II) distributing said composition along a plurality of hair shafts.

~~12~~ 11)A method according to claim ~~11~~ 10 further comprising the step: III) permitting said compostion to dry. ~~which, when applied to frizzy hair and permitted to dry, causes a reduction in hair frizz after incubation at 80° F and 80% humidity for 6 hours as compared to the hair frizz of untreated, otherwise identical frizzy hair incubated under identical conditions.~~

~~13~~ 12) Use of a composition as defined in any one of claims 1 to 8 ~~1, 2, and 3 to 11~~ to reduce hair frizz by applying the composition to frizzy hair, said reduction being measured relative to untreated, otherwise identical frizzy hair after both the treated frizzy hair and the untreated frizzy hair are incubated at 80° F and 80% humidity for 6 hours.

~~14~~ 13) The use of claim ~~13~~ 12 wherein the reduction in hair frizz is at least 80%,as measured by digital image analysis of said treated frizzy hair and said untreated frizzy hair at the end of said 6 hour time period.

~~15~~ 14) The method of claim ~~10~~ 9 wherein said polysiloxane fluid component comprises a propoxytetramethyl piperidinyl dimethicone component.

~~16~~ 15) The method of claim ~~10~~ 9 wherein the silicone-compatible, volatile liquid carrier comprises a component selected from the group consisting of a volatile siloxy component, a volatile hydrocarbon and a volatile alcohol; preferably wherein the silicone-compatible, volatile liquid carrier comprises a low molecular weight, volatile siloxy component.

~~17~~ 16) The method of any of claims ~~10 or 16~~ 9 or 15 wherein the polysiloxane fluid component ~~comprises a polysiloxane component comprising~~ further comprises an amodimethicone, a trimethyl silylamodimethicone component or an aminopropyl dimethicone component.