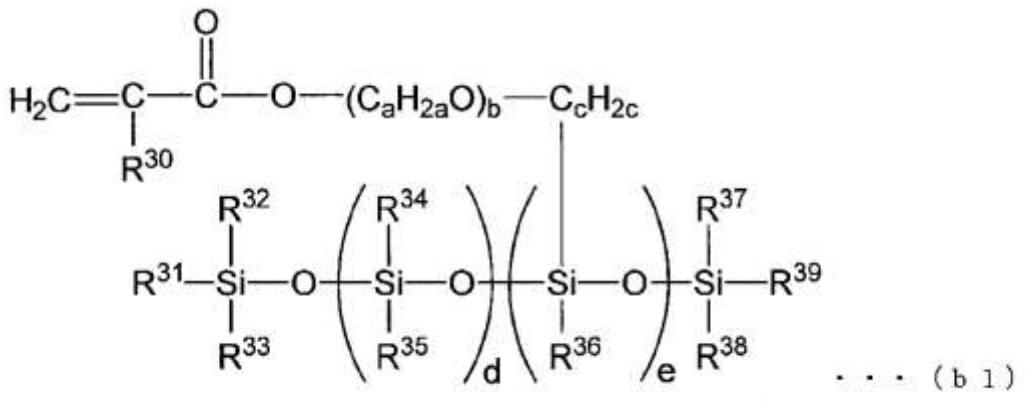
CLAIMS

1. A (meth)acrylic copolymer, comprising:

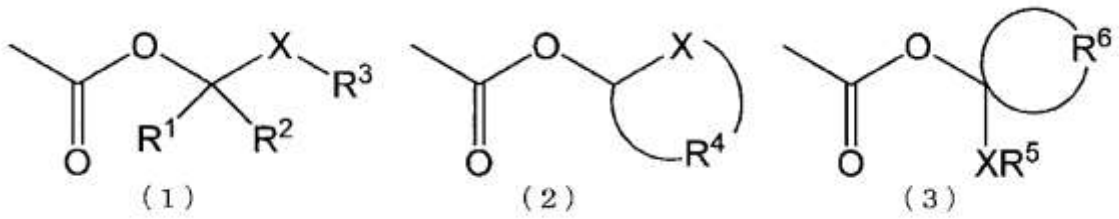
a constituent unit (B) derived from a polysiloxane block-containing polymerizable monomer (b) represented by Formula (b1),

at least one constituent unit (A) selected from the group consisting of a constituent unit (A1) having at least one structure (I) represented by Formula (1), Formula (2), or Formula (3), a constituent unit (A2) containing a triorganosilyloxycarbonyl group, and a constituent unit (A3) having at least one structure (III) represented by Formula (4) or Formula (5).



... (b1)

(in Formula (b1), R^{30} represents a hydrogen atom or a methyl group, a represents an integer of 2 to 5, b represents a number of 0 to 50, c represents an integer of 0 to 18, d represents a number of 1 to 1000, e represents a number of 1 to 80, R^{31} to R^{39} each represents an alkyl group, an alkoxy group, a phenyl group, a substituted phenyl group, a phenoxy group, or a substituted phenoxy group).



(1) (2) (3)

(in Formulae (1) to (3), X represents -O-, -S-, or $-NR^{14}-$, R^{14} represents a hydrogen atom or an alkyl group, R^1 and R^2 each represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, R^3 and R^5 each represents an alkyl group having 1 to 20 carbon atoms, a cycloalkyl group, or an aryl group, and R^4 and R^6 each represents an alkylene group having 1 to 10 carbon atoms.)

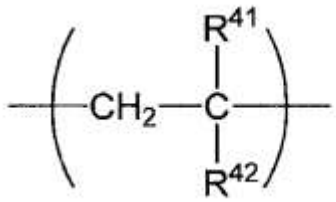
-COO-M-OCO- ··· (4)

$-COO-M-R^{22}$ ··· (5)

(in Formulae (4) and (5), M represents Zn, Cu, Mg, or Ca, and R^{22} represents a monovalent organic acid residue.)

2. The (meth)acrylic copolymer according to Claim 1, further comprising:
a constituent unit (C) derived from a macromonomer (c).

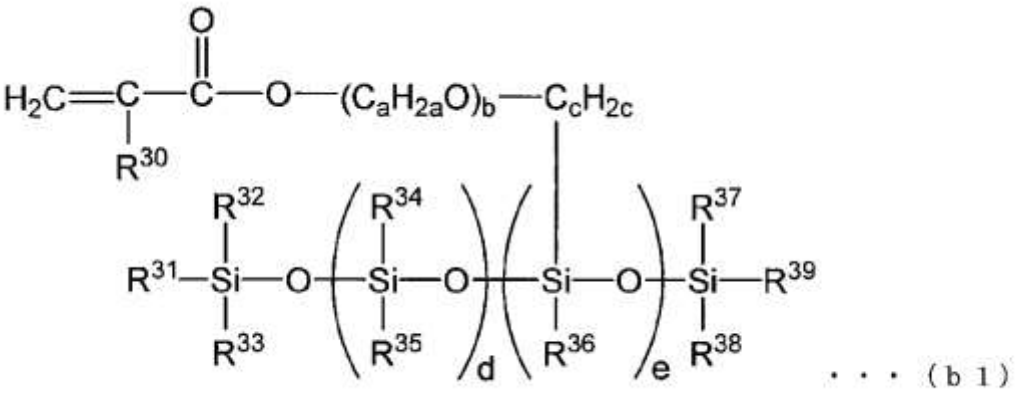
3. The (meth)acrylic copolymer according to Claim 2,
wherein the macromonomer (c) has two or more constituent units represented by Formula (c')



... (c')

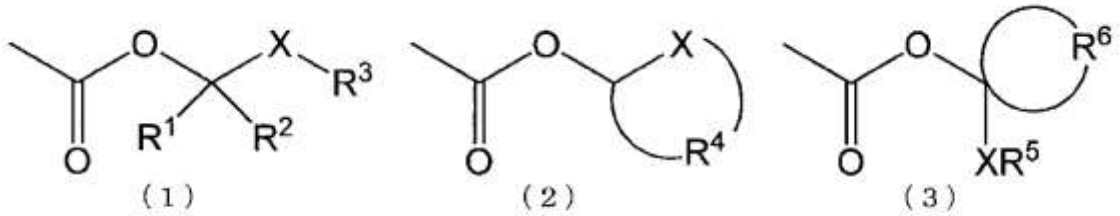
(in Formula (c'), R^{41} represents a hydrogen atom, a methyl group, or CH_2OH, R^{42} represents OR^{43}, a halogen atom, COR^{44}, $COOR^{45}$, CN, $CONR^{46}R^{47}$, or R^{48}, R^{43} to R^{47} each independently represents a hydrogen atom, an alkyl group having an unsubstituted or substituted group, an alicyclic group having an unsubstituted or substituted group, an aryl group having an unsubstituted or substituted group, a heteroaryl group having an unsubstituted or substituted group, a non-aromatic heterocyclic group having an unsubstituted or substituted group, an aralkyl group having an unsubstituted or substituted group, an alkaryl group having an unsubstituted or substituted group, or an organosilyl group having an unsubstituted or substituted group, and R^{48} represents an aryl group having an unsubstituted or substituted group or a heteroaryl group having an unsubstituted or substituted group).

4. A method for producing a (meth)acrylic copolymer, comprising:
a step of polymerizing a monomer mixture which contains a polysiloxane block-containing polymerizable monomer (b) represented by Formula (b1) and a polymerizable monomer different from the polysiloxane block-containing polymerizable monomer (b) to obtain a (meth)acrylic copolymer,
wherein the (meth)acrylic copolymer, at least one constituent unit (A) selected from the group consisting of a constituent unit (A1) having at least one structure (I) represented by Formula (1), Formula (2), or Formula (3), a constituent unit (A2) containing a triorganosilyloxycarbonyl group, and a constituent unit (A3) having at least one structure (III) represented by Formula (4) or Formula (5).



(b1)

(in Formula (b1), R^{30} represents a hydrogen atom or a methyl group, a represents an integer of 2 to 5, b represents a number of 0 to 50, c represents an integer of 0 to 18, d represents a number of 1 to 1000, e represents a number of 1 to 80, R^{31} to R^{39} each represents an alkyl group, an alkoxy group, a phenyl group, a substituted phenyl group, a phenoxy group, or a substituted phenoxy group).



(1) (2) (3)

(in Formulae (1) to (3), X represents -O-, -S-, or $-NR^{14}-$, R^{14} represents a hydrogen atom or an alkyl group, R^1 and R^2 each represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, R^3 and R^5 each represents an alkyl group having 1 to 20 carbon atoms, a cycloalkyl group, or an aryl group, and R^4 and R^6 each represents an alkylene group having 1 to 10 carbon atoms.)

-COO-M-OCO- ··· (4)

$-COO-M-R^{22}$ ··· (5)

(in Formulae (4) and (5), M represents Zn, Cu, Mg, or Ca, and R^{22} represents a monovalent organic acid residue.)

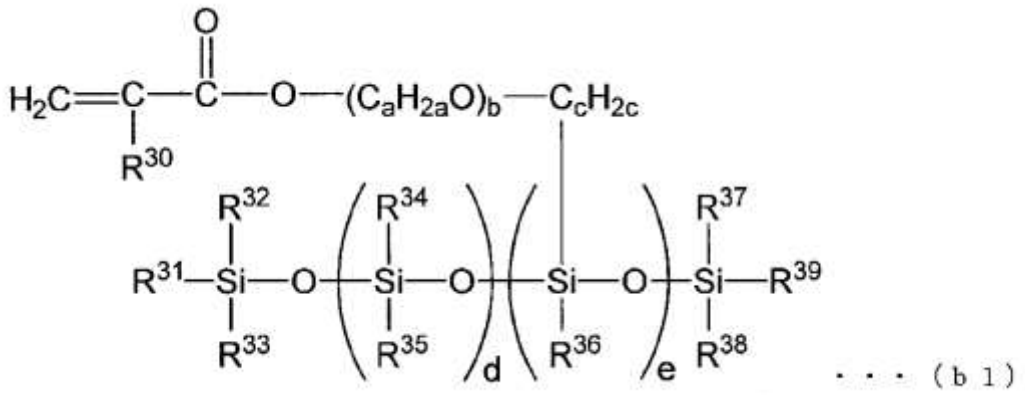
5. A resin composition, comprising:

the (meth)acrylic copolymer according to Claim 1.

6. A resin composition, comprising:

a (meth)acrylic copolymer having a constituent unit (B) derived from a polysiloxane block-containing polymerizable monomer (b) represented by Formula (b1), and

the resin composition further comprising a silicone oil.

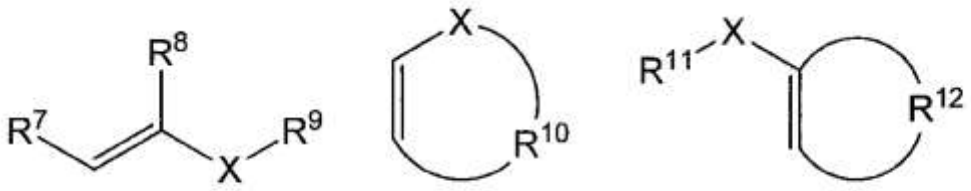


(b1)

(in Formula (b1), R^{30} represents a hydrogen atom or a methyl group, a represents an integer of 2 to 5, b represents a number of 0 to 50, c represents an integer of 0 to 18, d represents a number of 1 to 1000, e represents a number of 1 to 80, R^{31} to R^{39} each represents an alkyl group, an alkoxy group, a phenyl group, a substituted phenyl group, a phenoxy group, or a substituted phenoxy group).

7. The resin composition according to Claim 5 or 6, further comprising:
an organic solvent.

8. The resin composition according to Claim 5 or 6,
wherein the (meth)acrylic copolymer has the constituent unit (A1), and
the resin composition further comprising at least one compound (Y) selected from the group consisting of a compound represented by Formula (31), a compound represented by Formula (32), and a compound represented by Formula (33)



(31) (32) (33)

(in Formulae (31) to (33), X represents -O-, -S-, or $-NR^{14}-$, R^{14} represents a hydrogen atom or an alkyl group, R^{7} represents a hydrogen atom or an alkyl group having 1 to 9 carbon atoms, R^{8} represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, R^{9} and R^{11} each represents an alkyl group having 1 to 20 carbon atoms, a cycloalkyl group, or an aryl group, R^{10} represents a single bond or an alkylene group having 1 to 9 carbon atoms, and R^{12} represents an alkylene group having 1 to 9 carbon atoms).

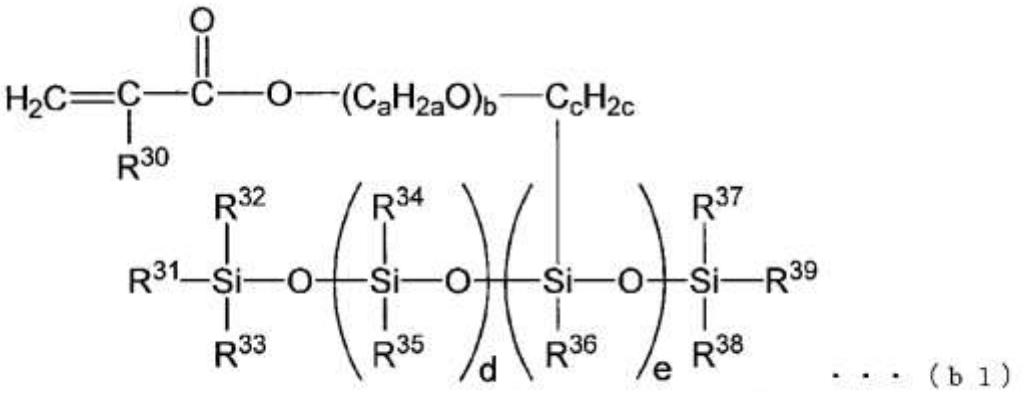
9. An antifouling paint composition, comprising:

the resin composition according to Claim 5 or 6.

10. An antifouling paint composition, comprising:

a resin composition contains a (meth)acrylic copolymer which having a constituent unit (B) derived from a polysiloxane block-containing polymerizable monomer (b) represented by Formula (b1), and

the antifouling paint composition further comprising an antifouling agent.



. . . (b 1)

(in Formula (b1), R^{30} represents a hydrogen atom or a methyl group, a represents an integer of 2 to 5, b represents a number of 0 to 50, c represents an integer of 0 to 18, d represents a number of 1 to 1000, e represents a number of 1 to 80, R^{31} to R^{39} each represents an alkyl group, an alkoxy group, a phenyl group, a substituted phenyl group, a phenoxy group, or a substituted phenoxy group).

11. The antifouling paint composition according to Claim 9, further comprising:

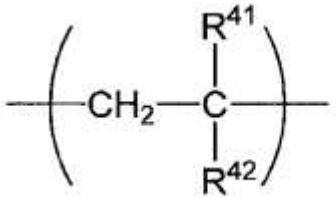
a thermoplastic resin other than the (meth)acrylic copolymer.

12. The antifouling paint composition according to Claim 10,

wherein the resin composition, the (meth)acrylic copolymer further comprising a constituent unit (C) derived from a macromonomer (c).

13. The antifouling paint composition according to Claim 12,

wherein the resin composition, the macromonomer (c) contained in the (meth)acrylic copolymer has two or more constituent units represented by Formula (c').



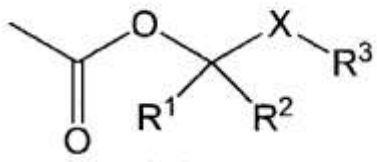
. . . (c')

(in Formula (c'), R^{41} represents a hydrogen atom, a methyl group, or CH_2OH, R^{42} represents OR^{43}, a halogen atom, COR^{44}, $COOR^{45}$, CN, $CONR^{46}R^{47}$, or R^{48}, R^{43} to R^{47} each independently represents a hydrogen atom, an alkyl group having an unsubstituted or substituted group, an alicyclic group having an unsubstituted or substituted group, an aryl group having an unsubstituted or substituted group, a heteroaryl group having an unsubstituted or substituted group, a non-aromatic heterocyclic group having an unsubstituted or substituted group, an aralkyl group having an unsubstituted or substituted group, an alkaryl group having an unsubstituted or substituted group, or an organosilyl group having an unsubstituted or substituted group, and R^{48} represents an aryl group having an unsubstituted or substituted group or a heteroaryl group having an unsubstituted or substituted group).

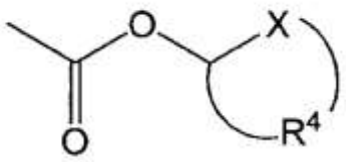
14. The antifouling paint composition according to Claim 10,

wherein the resin composition, the (meth)acrylic copolymer, comprising the constituent unit (A1) having at least one structure (I) represented by Formula (1), Formula (2), or Formula (3), and

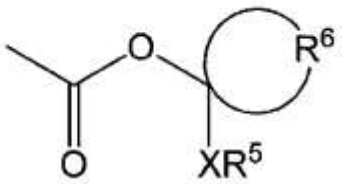
the (meth)acrylic copolymer further comprising at least one compound (Y) selected from the group consisting of a compound represented by Formula (31), a compound represented by Formula (32), and a compound represented by Formula (33).



(1)

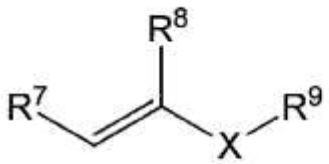


(2)

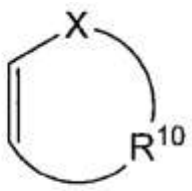


(3)

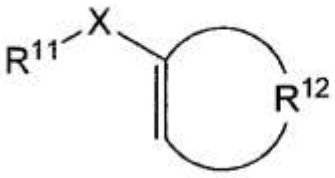
(in Formulae (1) to (3), X represents -O-, -S-, or $-NR^{14}-$, R^{14} represents a hydrogen atom or an alkyl group, R^1 and R^2 each represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, R^3 and R^5 each represents an alkyl group having 1 to 20 carbon atoms, a cycloalkyl group, or an aryl group, and R^4 and R^6 each represents an alkylene group having 1 to 10 carbon atoms.)



(31)



(32)



(33)

(in Formulae (31) to (33), X represents -O-, -S-, or -NR^{14}-, R^{14} represents a hydrogen atom or an alkyl group, R^7 represents a hydrogen atom or an alkyl group having 1 to 9 carbon atoms, R^8 represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, R^9 and R^{11} each represents an alkyl group having 1 to 20 carbon atoms, a cycloalkyl group, or an aryl group, R^{10} represents a single bond or an alkylene group having 1 to 9 carbon atoms, and R^{12} represents an alkylene group having 1 to 9 carbon atoms).