

Search history

Search 1: PN=(WO2015/129191) (Results 1)

Search 2: [SP]: technical field[0001] the present disclosure relates to a steel sheet for crown caps that is excellent in shape uniformity during forming of crown caps used for beer bottles etc., to a method for manufacturing the steel sheet, and to crown caps.background art[0002] from the viewpoint of environmental load reduction and cost reduction in recent years, steel sheets for crown caps used for beer bottle caps etc. are being reduced in thickness. generally, there are the following two types of steel sheets reduced in thickness. one is sr (single reduced) steel subjected to hot rolling, cold rolling, annealing, and then temper rolling, and the other is dr (double reduced) steel subjected to secondary cold rolling. as for steel sheets for crown caps, the demand for steel sheets having a thickness of 0.20 mm or less is increasing, and dr steel subjected to secondary cold rolling is preferred because work hardening can be utilized in order to compensate for a reduction in pressure capacity due to a reduction in thickness. however, the dr steel is generally harder than the sr steel, and a problem with the dr steel is its low formability.[0003] when a crown cap is formed, a central portion is drawn to some extent at the initial stage of forming, and then an outer edge portion is formed into a fluted shape. the use of a steel sheet with low formability may cause a defective shape, i.e., non-uniform flute shapes. a crown cap with non-uniform flute shapes has a problem in that, after the crown cap is put on a bottle, pressure capacity is not achieved and leakage of the content occurs, so that the crown cap does not server as a cap. if the strength of the steel sheet of a crown cap is low, there is a risk that the crown cap comes off even when the shapes of the flutes are uniform.[0004] one well-known steel sheet having good formability is ultra-low carbon if (interstitial free) steel. for the purpose of achieving an improvement in formability and a reduction in thickness simultaneously, many studies have been conducted on dr steel that uses the ultra-low carbon steel (for example, patent literature 1 to patent literature 3).citation listpatent literature[0005] ptl 1: japanese unexamined patent application publication no. 7-11333[0006] ptl 2: japanese unexamined patent application publication no. 5-287445[0007] ptl 3: japanese unexamined patent application publication no. 2010-255021summarytechnical problem[0008] however, even when the above conventional techniques are applied to crown caps, the crown caps have a problem in that the performance of the crown caps cannot be ensured.[0009] it is an object of the present disclosure to provide a steel sheet for crown caps that is excellent in formability, a method for manufacturing the steel sheet, and a crown cap.solution to problem[0010] to solve the foregoing problem, the present inventors have conducted extensive studies. the present inventors have studied the chemical composition, hot rolling conditions, cold rolling conditions (primary and secondary), and continuous annealing conditions of ultra-low carbon steel used as a base material. the present inventors have found that, by increasing an average r value and controlling a yp to a suitable value, the rate of occurrence of defective shapes can be reduced and pressure capacity can be ensured.[0011] exemplary embodiments may include as follows.[0012] [1] a steel sheet for crown caps, the steel sheet comprising, in mass percent, c: 0.0005 to 0.0050 percent, si: 0.020 percent or less, mn: 0.10 to 0.60 percent, p: 0.020 percent or less, s: 0.020 percent or less, al: 0.01 to 0.10 percent or less, n: 0.0050 percent or less, and nb: 0.010 to 0.050 percent, the balance being fe and inevitable impurities, the steel sheet having an average r value of 1.30 or more and a yp of 450 mpa or more and 650 mpa or less.[0013] [2] the steel sheet for crown caps according to [1] above, wherein an elongation rate of ferrite is 4.2 or less.[0014] [3] a method for manufacturing a steel sheet for crown caps, the method comprising: hot rolling a steel slab having a chemical composition according to [1] at a slab reheating temperature of 1, 150 degrees centigrade or higher and a finishing temperature of 870 degrees centigrade or higher coiling the hot rolled steel sheet at a coiling temperature of 600 degrees centigrade or higher performing pickling then performing primary cold rolling performing annealing at an annealing temperature of recrystallization temperature or more and 790 degrees centigrade or less and then performing secondary cold rolling at a rolling reduction of 10 percent or more and 50 percent or less.[0015] [4] a crown cap obtained by forming the steel sheet for crown caps according to [1] or [2].[0016] in the present disclosure, " percent " indicating the percentage of each compositional component is percent by mass.advantageous effects[0017] a steel sheet for crown caps that has an average r value or 1.30 or more and a yp of 450 mpa or more and 650 mpa or less and excellent in formability is obtained. the use of the steel sheet for crown caps of the disclosed embodiments can improve the shape uniformity of crown caps used for beer bottles etc. and allows sufficient pressure capacity to be achieved.brief description of drawing[0018] fig. 1 is an illustration showing the shape of flutes of a crown cap.description of embodiments[0019] first, a description will be given of compositional components.[c: 0.0005 to 0.0050 percent][0020] c is an element that increases the strength of the steel but decreases its formability. if the amount of solute c in the steel is large, yield elongation increases, and the large amount of solute c is likely to cause age hardening and stretcher strain during forming. therefore, when a continuous annealing method is used, it is necessary to control and reduce the content of c as much as possible at the stage of steelmaking. if the amount of remaining solute c is large, the steel sheet becomes hard, and wrinkles easily occur at the initial stage of the forming of a crown cap, causing an increase in the rate of occurrence of defective shapes. c is also an element having an influence on recrystallization texture. as the amount of c decreases, accumulation in a crystal orientation group in which a 111 direction is parallel to the normal to the sheet surface increases in the texture of the annealed sheet, and the average r value increases. the increase in the average r value improves drawability, and the defective shape of the crown cap is improved. therefore, the content of c is 0.0050 percent or less. to further improve the uniformity of the shape, the

content of c is preferably 0.0035 percent or less and more preferably 0.0023 percent or less. however, since excessive decarburization leads to an increase in cost of steelmaking, the lower limit of the content of c is 0.0005 percent.[si: 0.020 percent or less][0021] if a large amount of si is added, the surface treatability of the steel sheet deteriorates, and the corrosion resistance of the steel sheet is reduced. therefore, the amount of si is 0.020 percent or less.[mn: 0.10 to 0.60 percent][0022] mn is added for the purpose of preventing thermal embrittlement. mn also has the effect of preventing a reduction in hot ductility caused by s contained in the steel. it is necessary that the amount of mn added be 0.10 percent or more in order to obtain these effects. in a ladle analysis value specified in jis g 3303 or a ladle analysis value specified by the american society for testing materials (astm a623m-11), the upper limit of mn in tin mill black plates used for general food containers is specified to be 0.60 percent or less. therefore, the upper limit of mn in the disclosed embodiments is 0.60 percent or less. from the viewpoint of formability, mn is preferably 0.45 percent or less.[p: 0.020 percent or less][0023] if a large amount of p is added, the steel becomes hard, and its formability deteriorates. in addition, the large amount of p causes a reduction in corrosion resistance. therefore, the upper limit of p is 0.020 percent.[s: 0.020 percent or less][0024] s is bonded to fe in the steel to thereby form fes, and this causes a reduction in the hot ductility of the steel. to prevent this reduction, s is 0.020 percent or less. if the amount of s is excessively small, the risk of the occurrence of pitting corrosion increases. therefore, s is preferably 0.008 percent or more.[al: 0.01 to 0.10 percent][0025] al is an element added as a deoxidizer. in addition, since al and n form aln, al has the effect of reducing the amount of solute n in the steel. if the content of al is less than 0.01 percent, the deoxidation effect and the effect of reducing the amount of solute n are not sufficient. a content of al exceeding 0.10 percent is not preferable because not only these effects are saturated but also the amount of inclusions such as alumina increases. therefore, the content of al is within the range of 0.01 percent or more and 0.10 percent or less.[n: 0.0050 percent or less][0026] if the amount of n is large, the steel becomes hard due to strain age hardening, and the formability deteriorates. in addition, it is necessary to increase the amount of an element added in order to fix solute n, and this leads to an increase in cost. therefore, the upper limit of n is 0.0050 percent or less. it is difficult to stably reduce the amount of n to less than 0.0010 percent, and this causes the cost of manufacturing to increase. therefore, n is preferably 0.0010 percent or more.[nb: (Results 18)

Search 1: TAC=((suit or overall) and (beekeeper or bee*)) and FT=(hood and mesh and (velcro or (hook* w2 loop*)) and (layer* w5 (fabric or material)) and fabric) (Results 14)

Search 2: TAC=((suit or overall or costume) and (beekeeper or bee*)) (Results 72695)

Search 3: (2) and FT=(hood and mesh) (Results 229)

Search 4: (3) and FT=(polyester or polyamide or nylon or aramide) (Results 89)

Search 5: (2) and FT=(zipper and (velcro or strips)) (Results 128)

Search 6: TAC=((suit or overall or costume or cloth*) and (beekeeper or bee or bees)) (Results 1153)

Search 7: (6) and FT=(zipper w5 (velcro or (hook* w2 loop*))) (Results 2)

Search 8: (6) and FT=(hood and mesh and (layer* w4 (fabric or material))) (Results 6)

Search 9: (6) and FT=((layer* w4 (fabric or material)) and ((fire w1 (resistan* or proof*)) or fireproof*)) (Results 1)

Search 10: (6) and FT=((layer* w4 (fabric or material)) and (polyester or polyamide or nylon or aramide)) (Results 23)

- session log created:19 March 2018 23:09:32

- Update information:

PatBase Coverage at Update 2018 Week 11 (Year 2018 Week 11)

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Major countries

Publishing body	Document type	Bibliographic publication date		Full-Text publication date	
		Earliest	Latest	Earliest	Latest
CN China	Patent Applications	19850910	20180316	19850910	20180316
	Patents	19930106	20180316	19930106	20180316
	Utility Model Applications	19850409	19921230	19850409	19921230
	Utility Models	19930106	20180316	19930106	20180316
	Designs	19850910	20180316	19850910	20150819
DE Germany	Patent Applications	19211221	20180315	19650317	20180315
	Patents	18770101	20180315	19200113	20180315
	Utility Models	19280626	20180315	19610831	20180315
	EP/WO Patents	19871217	20140410		
EP European Patent Office	Patent Applications	19781220	20180314	19781220	20180314
	Patents	19800109	20180314	19800109	20180314
FR France	Patent Applications	19690307	20180316	19810102	20180223
	Patents	18550227	20180316	19600502	20180316
	Utility Model Applications	19720107	20180316	19800104	20180223
	Utility Models	19730112	20180316	19690802	20180309
GB United Kingdom	Unpublished Patent Applications	19830209	20180307		
	Patent Applications	19790104	20180314	19790104	20180228
	Patents	17820704	20180314	19020911	19811216
JP Japan	Patent Applications	19710116	20180315	19930108	20180308
	Patents	19281026	20180228	19960529	20180228
	Utility Model Applications	19710723	20060209	19990817	20031107
	Utility Models	19640805	19960329		
	Registered Utility Models	19940726	20180301	19940726	20101216
	Designs	20141110	20180312		
KR Republic of Korea	Patent Applications	19781209	20180316	19780430	20180316
	Patents	19700820	20180316	19770628	20180316
	Utility Model Applications	19781127	20180316	19940730	20180316
	Utility Models	19780110	20180316	19970104	20180316
US United States of America	Patent Applications	20010315	20180315	20010315	20180315
	Patents	18360101	20180313	18560617	20180313
	Designs	18650912	20180313	19770719	20180313
WO World Intellectual Property Organization (WIPO)	Patent Applications	19781019	20180315	19781019	20180315
	Designs	20151023	20180316	20151023	20180316

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• **search:** SS1 PN=(WO2015/129191) (Results 1)

• List: SS1 1–25 (PN=(WO2015/129191)) (Results 1)

• **search:** SS2 [SP]: technical field[0001] the present disclosure relates to a steel sheet for crown caps that is excellent in shape uniformity during forming of crown caps used for beer bottles etc., to a method for manufacturing the steel sheet, and to crown caps.background art[0002] from the viewpoint of environmental load reduction and cost reduction in recent years, steel sheets for crown caps used for beer bottle caps etc. are being reduced in thickness. generally, there are the following two types of steel sheets reduced in thickness. one is sr (single reduced) steel subjected to hot rolling, cold rolling, annealing, and then temper rolling, and the other is dr (double reduced) steel subjected to secondary cold rolling. as for steel sheets for crown caps, the demand for steel sheets having a thickness of 0.20 mm or less is increasing, and dr steel subjected to secondary cold rolling is preferred because work hardening can be utilized in order to compensate for a reduction in pressure capacity due to a reduction in thickness. however, the dr steel is generally harder than the sr steel, and a problem with the dr steel is its low formability.[0003] when a crown cap is formed, a central portion is drawn to some extent at the initial stage of forming, and then an outer edge portion is formed into a fluted shape. the use of a steel sheet with low formability may cause a defective shape, i.e., non-uniform flute shapes. a crown cap with non-uniform flute shapes has a problem in that, after the crown cap is put on a bottle, pressure capacity is not achieved and leakage of the content occurs, so that the crown cap does not server as a cap. if the strength of the steel sheet of a crown cap is low, there is a risk that the crown cap comes off even when the shapes of the flutes are uniform.[0004] one well-known steel sheet having good formability is ultra-low carbon if (interstitial free) steel. for the purpose of achieving an improvement in formability and a reduction in thickness simultaneously, many studies have been conducted on dr steel that uses the ultra-low carbon steel (for example, patent literature 1 to patent literature 3).citation listpatent literature[0005] ptl 1: japanese unexamined patent application publication no. 7-11333[0006] ptl 2: japanese unexamined patent application publication no. 5-287445[0007] ptl 3: japanese unexamined patent application publication no. 2010-255021summarytechnical problem[0008] however, even when the above conventional techniques are applied to crown caps, the crown caps have a problem in that the performance of the crown caps cannot be ensured.[0009] it is an object of the present disclosure to provide a steel sheet for crown caps that is excellent in formability, a method for manufacturing the steel sheet, and a crown cap.solution to problem[0010] to solve the foregoing problem, the present inventors have conducted extensive studies. the present inventors have studied the chemical composition, hot rolling conditions, cold rolling conditions (primary and secondary), and continuous annealing conditions of ultra-low carbon steel used as a base material. the present inventors have found that, by increasing an average r value and controlling a yp to a suitable value, the rate of occurrence of defective shapes can be reduced and pressure capacity can be ensured.[0011] exemplary embodiments may include as follows.[0012] [1] a steel sheet for crown caps, the steel sheet comprising, in mass percent, c: 0.0005 to 0.0050 percent, si: 0.020 percent or less, mn: 0.10 to 0.60 percent, p: 0.020 percent or less, s: 0.020 percent or less, al: 0.01 to 0.10 percent or less, n: 0.0050 percent or less, and nb: 0.010 to 0.050 percent, the balance being fe and inevitable impurities, the steel sheet having an average r value of 1.30 or more and a yp of 450 mpa or more and 650 mpa or less.[0013] [2] the steel sheet for crown caps according to [1] above, wherein an elongation rate of ferrite is 4.2 or less.[0014] [3] a method for manufacturing a steel sheet for crown caps, the method comprising: hot rolling a steel slab having a chemical composition according to [1] at a slab reheating temperature of 1,150 degrees centigrade or higher and a finishing temperature of 870 degrees centigrade or higher coiling the hot rolled steel sheet at a coiling temperature of 600 degrees centigrade or higher performing pickling then performing primary cold rolling performing annealing at an annealing temperature of recrystallization temperature or more and 790 degrees centigrade or less and then performing secondary cold rolling at a rolling reduction of 10 percent or more and 50 percent or less.[0015] [4] a crown cap obtained by forming the steel sheet for crown caps according to [1] or [2].[0016] in the present disclosure, "percent" indicating the percentage of each compositional component is percent by mass.advantageous effects[0017] a steel sheet for crown caps that has an average r value or 1.30 or more and a yp of 450 mpa or more and 650 mpa or less and excellent in formability is obtained. the use of the steel sheet for crown caps of the disclosed embodiments can improve the shape uniformity of crown caps used for beer bottles etc. and allows sufficient pressure capacity to be achieved.brief description of drawing[0018] fig. 1 is an illustration showing the shape of flutes of a crown cap.description of embodiments[0019] first, a description will be given of compositional components.[c: 0.0005 to 0.0050 percent][0020] c is an element that increases the strength of the steel but decreases its formability. if the amount of solute c in the steel is large, yield elongation increases, and the large amount of solute c is likely to cause age hardening and stretcher strain during forming. therefore, when a continuous annealing method is used, it is necessary to control and reduce the content of c as much as possible at the stage of steelmaking. if the amount of remaining solute c is large, the steel sheet becomes hard, and wrinkles easily occur at the initial stage of the forming of a crown cap, causing an increase in the rate of occurrence of defective shapes. c is also an element having an influence on recrystallization texture. as the amount of c decreases, accumulation in a crystal orientation group in which a 111 direction is parallel to the normal to the sheet surface increases in the texture of the annealed sheet, and the average r value increases. the increase in the average r value improves drawability, and the defective shape of the crown cap is improved. therefore, the content of c is 0.0050 percent or less. to further improve the uniformity of the shape, the content of c is preferably 0.0035 percent or less and more preferably 0.0023 percent or less. however, since excessive decarburization leads to an increase in cost of steelmaking, the lower limit of the content of c is 0.0005 percent.[si: 0.020 percent or less][0021] if a large amount of si is added, the surface treatability of the steel sheet deteriorates, and the corrosion resistance of the steel sheet is reduced. therefore, the amount of si is 0.020 percent or less.[mn: 0.10 to 0.60 percent][0022] mn is added for the purpose of preventing thermal embrittlement. mn also has the effect of preventing a reduction in hot ductility caused by s contained in the steel. it is necessary that the amount of mn added be 0.10 percent or more in order to obtain these effects. in a ladle

analysis value specified in jis g 3303 or a ladle analysis value specified by the american society for testing materials (astm a623m-11), the upper limit of mn in tin mill black plates used for general food containers is specified to be 0.60 percent or less. therefore, the upper limit of mn in the disclosed embodiments is 0.60 percent or less. from the viewpoint of formability, mn is preferably 0.45 percent or less.[p: 0.020 percent or less][0023] if a large amount of p is added, the steel becomes hard, and its formability deteriorates. in addition, the large amount of p causes a reduction in corrosion resistance. therefore, the upper limit of p is 0.020 percent.[s: 0.020 percent or less][0024] s is bonded to fe in the steel to thereby form fes, and this causes a reduction in the hot ductility of the steel. to prevent this reduction, s is 0.020 percent or less. if the amount of s is excessively small, the risk of the occurrence of pitting corrosion increases. therefore, s is preferably 0.008 percent or more.[al: 0.01 to 0.10 percent][0025] al is an element added as a deoxidizer. in addition, since al and n form aln, al has the effect of reducing the amount of solute n in the steel. if the content of al is less than 0.01 percent, the deoxidation effect and the effect of reducing the amount of solute n are not sufficient. a content of al exceeding 0.10 percent is not preferable because not only these effects are saturated but also the amount of inclusions such as alumina increases. therefore, the content of al is within the range of 0.01 percent or more and 0.10 percent or less.[n: 0.0050 percent or less][0026] if the amount of n is large, the steel becomes hard due to strain age hardening, and the formability deteriorates. in addition, it is necessary to increase the amount of an element added in order to fix solute n, and this leads to an increase in cost. therefore, the upper limit of n is 0.0050 percent or less. it is difficult to stably reduce the amount of n to less than 0.0010 percent, and this causes the cost of manufacturing to increase. therefore, n is preferably 0.0010 percent or more.[nb: (Results 18)]

- List: SS2 1-25 ([SP]: technical field[0001] the present disclosure relates to a steel sheet for crown caps that is excellent in shape uniformity during forming of crown caps used for beer bottles etc., to a method for manufacturing the steel sheet, and to crown caps.background art[0002] from the viewpoint of environmental load reduction and cost reduction in recent years, steel sheets for crown caps used for beer bottle caps etc. are being reduced in thickness. generally, there are the following two types of steel sheets reduced in thickness. one is sr (single reduced) steel subjected to hot rolling, cold rolling, annealing, and then temper rolling, and the other is dr (double reduced) steel subjected to secondary cold rolling. as for steel sheets for crown caps, the demand for steel sheets having a thickness of 0.20 mm or less is increasing, and dr steel subjected to secondary cold rolling is preferred because work hardening can be utilized in order to compensate for a reduction in 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less.[0014] [3] a method for manufacturing a steel sheet for crown caps, the method comprising: hot rolling a steel slab having a chemical composition according to [1] at a slab reheating temperature of 1,150 degrees centigrade or higher and a finishing temperature of 870 degrees centigrade or higher coiling the hot rolled steel sheet at a coiling temperature of 600 degrees centigrade or higher performing pickling then performing primary cold rolling performing annealing at an annealing temperature of recrystallization temperature or more and 790 degrees centigrade or less and then performing secondary cold rolling at a rolling reduction of 10 percent or more and 50 percent or less.[0015] [4] a crown cap obtained by forming the steel sheet for crown caps according to [1] or [2].[0016] in the present disclosure, "percent" indicating the percentage of each compositional component is percent by mass.advantageous effects[0017] a steel sheet for crown caps that has an average r value or 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also an element having an influence on recrystallization texture. as the amount of c decreases, accumulation in a crystal orientation group in which a 111 direction is parallel to the normal to the sheet surface increases in the texture of the annealed sheet, and the average r value increases. the increase in the average r value improves drawability, and the defective shape of the crown cap is improved. therefore, the content of c is 0.0050 percent or less. to further improve the uniformity of the shape, the content of c is preferably 0.0035 percent or less and more preferably 0.0023 percent or less. however, since excessive decarburization leads to an increase in cost of steelmaking, the lower limit of the content of c is 0.0005 percent.[si: 0.020 percent or less][0021] if a large amount of si is added, the surface treatability of the steel sheet deteriorates, and the corrosion resistance of the steel sheet is reduced. therefore, the amount of si is 0.020 percent or less.[mn: 0.10 to 0.60 percent][0022] mn is added for the purpose of preventing thermal embrittlement. mn also has the effect of preventing a reduction in hot ductility caused by s contained in the steel. it is necessary that the amount of mn added be 0.10 percent or more in order to obtain these effects. in a ladle analysis value specified in jis g 3303 or a ladle analysis value specified by the american society for testing materials (astm a623m-11), the upper limit of mn in tin mill black plates used for general food containers is specified to be 0.60 percent or less. therefore, the upper limit of mn in the disclosed embodiments is 0.60 percent or less. from the viewpoint of formability, mn is preferably 0.45 percent or less.[p: 0.020 percent or less][0023] if a large amount of p is added, the steel becomes hard, and its formability deteriorates. in addition, the large amount of p causes a reduction in corrosion resistance. therefore, the upper limit of p is 0.020 percent.[s: 0.020 percent or less][0024] s is bonded to fe in the steel to thereby form fes, and this causes a reduction in the hot ductility of the steel. to prevent this reduction, s is 0.020 percent or less. if the amount of s is excessively small, the risk of the occurrence of pitting corrosion increases. therefore, s is preferably 0.008 percent or more.[al: 0.01 to 0.10 percent][0025] al is an element added as a deoxidizer. in addition, since al and n form aln, al has the effect of reducing the amount of solute n in the steel. if the content of al is less than 0.01 percent, the deoxidation effect and the effect of reducing the amount of solute n are not sufficient. a content of al exceeding 0.10 percent is not preferable because not only these effects are saturated but also the amount of inclusions such as alumina increases. therefore, the content of al is within the range of 0.01 percent or more and 0.10 percent or less.[n: 0.0050 percent or less][0026] if the amount of n is large, the steel becomes hard due to strain age hardening, and the formability deteriorates. in addition, it is necessary to increase the amount of an element added in order to fix solute n, and this leads to an increase in cost. therefore, the upper limit of n is 0.0050 percent or less. it is difficult to stably reduce the amount of n to less than 0.0010 percent, and this causes the cost of manufacturing to increase. therefore, n is preferably 0.0010 percent or more.[nb:] (Results 18)

- Login to Patbase:20 March 2018 15:35:38
- Logoff from Patbase:20 March 2018 15:35:42
- Login to Patbase:20 March 2018 15:36:09
- search history cleared
- **search:** SS1 TAC=((suit or overall) and (beekeeper or bee*)) and FT=(hood and mesh and (velcro or (hook* w2 loop*)) and (layer* w5 (fabric or material)) and fabric) (Results 14)
- List: SS1 1-25 (TAC=((suit or overall) and (beekeeper or bee*)) and FT=(hood and mesh and (velcro or (hook* w2 loop*)) and (layer* w5 (fabric or material)) and fabric)) (Results 14)
- **search:** SS2 TAC=((suit or overall or costume) and (beekeeper or bee*)) (Results 72695)
- **search:** SS3 (2) and FT=(hood and mesh) (Results 229)
- **search:** SS4 (3) and FT=(polyester or polyamide or nylon or aramide) (Results 89)
- List: SS4 1-25 ((3) and FT=(polyester or polyamide or nylon or aramide)) (Results 89)
- **search:** SS5 (2) and FT=(zipper and (velcro or strips)) (Results 128)
- List: SS5 1-25 ((2) and FT=(zipper and (velcro or strips))) (Results 128)
- **search:** SS6 TAC=((suit or overall or costume or cloth*) and (beekeeper or bee or bees)) (Results 1153)
- **search:** SS7 (6) and FT=(zipper w5 (velcro or (hook* w2 loop*))) (Results 2)
- List: SS7 1-25 ((6) and FT=(zipper w5 (velcro or (hook* w2 loop*)))) (Results 2)
- **search:** SS8 (6) and FT=(hood and mesh and (layer* w4 (fabric or material))) (Results 6)
- List: SS8 1-25 ((6) and FT=(hood and mesh and (layer* w4 (fabric or material)))) (Results 6)
- **search:** SS9 (6) and FT=((layer* w4 (fabric or material)) and ((fire w1 (resistan* or proof*)) or fireproof*)) (Results 1)
- List: SS9 1-25 ((6) and FT=((layer* w4 (fabric or material)) and ((fire w1 (resistan* or proof*)) or fireproof*))) (Results 1)
- **search:** SS10 (6) and FT=((layer* w4 (fabric or material)) and (polyester or polyamide or nylon or aramide)) (Results 23)

- List: SS10 1–25 ((6) and FT=((layer* w4 (fabric or material)) and (polyester or polyamide or nylon or aramide)))
(Results 23)