Examiner's use only

Claims

1. [A sprinkler for automatically expelling a fire extinguishing fluid,][the sprinkler comprising a frame and a thermally responsive member,][the frame having an opening which is connectable to a source of fire extinguishing fluid and a valve closing the opening,][the thermally responsive member being held by the frame to bear against the valve][and containing a first and a second fluid that when exposed to heat, at least one of the species will expand to break the thermally responsive member to actuate the valve and allow fire extinguishing fluid to flow,][the actuation time being less than 12 s at 75 °C and less than 7 s at 120 °C.]

2. [A sprinkler according to Claim 1,][wherein the first species is a fluid and the second species is a liquid.]

3. [A sprinkler according to Claim 2,][wherein the first species and third species are immiscible liquids.]

4. [A sprinkler according to Claim 3,][wherein the first liquid has a boiling point and density less than the second liquid.]

5. [A sprinkler according to Claim 1,][wherein the thermally responsive member is a glass bulb with an upper pointed end and a lower rounded end,][the upper pointed end being for accommodating an air bubble.]

6. [A sprinkler according to Claim 5,][wherein the glass bulb has a wall between the two ends, which wall is thinner than the lower rounded end.]

		Examiner's use only
Construction		
See claims sheet for claim integers.		
Claim 1		
1.1		
"A sprinkler"	Sets the scene. P.6, 6-7 mounted to a ceiling. No other discussion of locations. Thus, ceiling mounted for directing fluid over a fire to put it out. ✓	0.5
"for"	Suitable for ✓	0.5
"automatically"	when necessary, i.e. in response to detecting a fire – p.3, 7-12, and rest of claim → of the frangible bulb type, i.e. detect fire (high T) then break to sprinkle.	
"expelling … fluid"	directing fluid over area to be protected by sprinkler – p.3, 11-12. Fire extinguishing fluids → suitable for extinguishing → different to fluids later a claim. Use of "for" → fire extinguishing fluid not part of ✓ claimed apparatus.	0.5
1.2		
"comprising"	includes the following features, but not exclusively, may include others as well ✓	0.5
"a frame"	structure for providing support to sprinkler – to hold it together. Feature 1 ("frame") in fig. 1 ✓	0.5
"thermally … member"	element which is releasable when temperature is increased from normal ambient (in this context room temp.) to operating temp. See p. 7, 4-6 operating T selectable to be suitable for typical fires. Member is glass bulb 6 in figs 1 and 2 – p.4, 35-37. Has to break in response to increased T. Its function is to break to enable sprinkler activation. Can't just respond a little, its response is breaking and thus allowing flow of fire extinguishing fluid. ✓	0.5
1.3		
"having"	same as "comprising".	
"opening"	in context, passage connecting fluid to sprinkler through which fire extinguishing fluid (herein 'FEF') can flow from source to sprinkler. See p. 5, 36-p.6, 2 → inlet 4. (fig. 1)	

		Examiner's use only
"which"	the frame. The opening is nothingness therefore it is the frame that will effect connection. FEF then flows through opening	
"connectable"	In use – capable of being connected to. Thus, the source of FEF is ✓ not a requirement of claimed apparatus	0.5
"a source … fluid"	irrelevant in context of function what or where the source is as long as it can provide FEF to sprinkler valve is something which can exist in two states: one obstructing fluid flow	
"and … opening"	from sprinkler (i.e. closing the opening), and one not, in which fluid may flow. Valve does not have to have any further properties merely just something which can provide this obstructing function. ✓	0.5
1.4		
"being … frame"	The frame provides support to keep it in place. Based on function of✓ thermally responsive member ('TRM') frame such that TRM will "bear against" valve unless it breaks then it won't.	0.5
"bear … valve"	To provide supporting force greater than (or equal to) that of the pressurized FEF trying to open valve. To keep the valve shut & no fluid flow until there is a fire . – p.3 5-12. ✓ See fig.1 – TRM 6 (glass vial) and valve 5 (cap)	0.5
1.5		
"containing"	inside the TRM there is the following, but not exclusively. e.g. air bubble not claimed, but will be there – p. 6. 18-20	
"a first and a second"	Construed to be separate entities. P.7, 4-6, this provides benefits of adjusting responsiveness. Can't be the same. Repercursive effect of claim 3 (with error sorted) – fluids could be mixed though, i.e. one uniform fluid comprising 2 components.	
"fluid"	when? at what temp? Because, everything can be fluid in some conditions. Obvious choice would be (see def. of automatic) one of ambient or operating T. I will select operating T because the purpose of it being a fluid is to provide expansion at fire temps so as to crack the glass. ✓ Thus, it could be solid at ambient, as long as it is fluid when it causes glass to break. Fluid means liquid or gas. As they	0.5

		Examiner's use only
	have used "fluid" in c.1 but "liquid" in c.2 – patentee ✓ must've done so intentionally. Note, see sufficiency section for one issue with this interpretation.	0.5
	r.e. the two fluids. This does not include an air bubble. See p. 5, 1 – it ✓ is impossible to avoid this, and p. 6, 18-20. The patentee would rather avoid it if they could, thus the two fluids will be construed not to include the air bubble, because the benefit of the two fluids (p. 4, 6-8) would not be effected by one of the fluids ✓ being an air bubble. However, air bubble not a requirement of claim 1, as it would be removed if possible, thus an apparatus absent said bubble is envisaged (p. 6, 18-20) Also, see p. 6, 17-18 gas bubble a third fluid	0.5 0.5
"that … member"	at least one → either or both could expand. (p. 4, 6-8) only need one, the other could just be there to control ratio of expansion. Exposure to heat could be in any form (conduction/convection/radiation). Heat from the fire. As set out @ p. 4, 1-2, expansion and fluid have to be suitable to break TRM not just to expand (as all fluids would do that) ✓	0.5
"to … flow"	Actuation → get the FEF flowing out of sprinkler into designated area – p. 3, 10-12. Thus, in context of spec – removal of force provided ✓ by TRM on valve. Thus, no more obstruction of flow path.	0.5
<u>1.6</u>		
"actuation time"	anticedence issued noted. See p. 4, 10-13. Time taken exposed to <u>constant</u> temperature. In reality, T is likely to increase with time, so one person's definition of "actuation time" may be different to another. In this case, there is a clear definition in desc. So adopt this. This claim feature is still directly verifiable by testing. ✓	0.5
"less than 12s at 75°C"	s = seconds – only logical option C = celsius, same. < 12 could be ≤ 12 or < 12 Likewise 12 ≈ 11.5≤ x ≤ 12.5. However, as time is of importance, p. 3-28,29.	

		Examiner's use only
	Therefore, construe as quickest options. Thus s < 12 i.e. highest in claim would be 11.999.	
"and"	has to satisfy both of these tests.	
"less … 120°C	Same approach as for 12 & 75. In both cases: ± 0.5 on Temp. Thus 74.5-75.5 & 119.5 – 120.5 As long as time threshold is met somewhere in that range, claim features satisfied.	

Claim 2

2.1

Contains all the features of claim 1, as well as the following features. (✓)

2.2

"species"	Taken to mean fluid for consistency ✓	0.5
"fluid"	same as for claim 1 – i.e. liquid or gas, when at actuation temperature ✓	0.5
"second … liquid"	The second fluid is liquid. i.e. specifically in its liquid phase ✓ at actuation temp. ✓ Note, as of yet there is no requirement that both expand to break, and thus either first (fluid) or second (liquid) or both could provide expansion to break the glass. Thus @ activation T, the first fluid could have evaporated, and it could be expansion of the second, in its liquid state, which causes expansion and breaking of glass.	0.5 0.5

Claim 3

3.1

A sprinkler with all features of claim 2 (and thus claim 1) plus the following i.e. 3 + 2 + 1 (✓)

3.2

"third"	this is an error. Construe as "second" – only logically consistent option. ✓	0.5
"first … and third"	implies both – "and" Therefore, first fluid is a liquid. ✓ As above, liquid @ actuation temp.	0.5
"Species"	Again, construe as "fluids"	

		Examiner's use only
"immiscible liquids"	When both in liquid phase (i.e. at actuation temp) they do not mix. P.4, 21. Perhaps ✓ check with an expert on the granularity of immiscibility? It is an absolute property or sliding scale? Construe as they are identifiably (i.e. upon visual inspection) separate liquids. Thus two liquids not properly "mixed" per se but in suspension (e.g. squash in water) will be taken as not immiscible, but two liquids (e.g oil and water) having a distinct separation are immiscible. Immiscibility judged @actuation temp.	0.5

Claim 4

4.1

Has all of the features of claim 3, and thus 2 and 1 also. Plus the following.
i.e. 4 + 3 + 2 +1 (✓)

4.2

"boiling point and density"	Are these dependent on environment/conditions e.g @ variable Temp or Pressure. Consult an expert. For consistency, all properties measured @ actuation temp.	
"and"	Both BP & one unclear word need to be lower for the first liquid. Again, as of yet, there is no requirement as to which (or both) gives rise to the expansion for breaking the glass. Thus, this just solidifies position that they are two different liquids and they are selected based on properties which enable greater scope for customising actuation conditions for the TRM – see p. 4, 21-25. It also enables floating characteristics to be controlled – see p. 4 – 27-29. ✓ This para affirms my decision to measure properties at actuation temp. Note, upon a much narrower construction r.e. two fluids (see sufficiency) this would see to make 1st liquid CH & second DMF (see table on p.7). But not my construction.	0.5

Claim 5 0.5

5.1

Has the features of claim 1, plus the following, i.e. 5+1 (✓)

5.2

"is"	Not "comprises", thus infer exclusivity i.e. a glass bulb and nothing else. Assume intention of patentee.	

		Examiner's use only
"glass bulb"	glass as the material. Again use of is implies uniformity of material. "Bulb" = any shape (light bulbs come in a variety of shapes). But has to be hollow – to "contain" the fluids. Consistent with shape of "6" in ✓ figs. 1 and 2.	0.5
"upper"	in use. Thus when inserted into ceiling. See p. 6, 14-20 & stem ✓ end region, then compare figs. 1 and 2. Fig. 1 is upside down. Upper = vertically above. Relative to lower	0.5
"Lower"	for same reasons, vertically below the upper.	
"pointed end"	See R.3 in fig. 2 (stem end region) i.e. narrower in cross-section than rest of bulb.	
"rounded end"	See R.2 in fig. 2 (spherical end region). Thus smooth shape to end to be rounded – generally spherical.	
5.3		
"being for"	is suitable for.	
"accommodating… bubble"	Its location when in use, i.e. vertically above is confirmed by this. Nothing else would affect its ability to "accommodate an air ✓ bubble". Because, see p.5, 1 air bubble impossible to avoid, so unlikely to be able to control its dimensions.	0.5
6.1		
Contains all of the features of claim 5 (and thus claim 1) plus the following. i.e. 6 + 5 +1(✓)		
6.2		
"has"	same as comprising	
"a wall"	See figs. 1 and 2 and description of central region R1 – p. 6, 9-20. The only consistent interpretation is the wall refers to the housing (e.g. outer shell) of the bulb. Not anything obstructing the fluids. Thus, for the device to work this feature has to be present✓ → construe as no limitation.	0.5
"which wall"	the wall.	

					Examiner's use only
"is thinner… end"	This is to permit breakage by expansion whilst enabling a force to be applied to hold the bulb in place against valve – see figs ✓ 1 and 2. Thus, construe as thickness (i.e. in cross-section) so shortest distance from inside the bulb to outside the bulb is greater at the lower end, than in the middle region of the bulb – see p. 6, 9-26.				0.5
				Dependencies	1
				MARKS AWARDED 16.5	

Infringement

Doc B dated July 2017. Announcing launch (p. 10, 1). P. 12, 1-2. Seems they may not have actually started selling yet? Although, client letter implies differently.

Analysis for both products (as described in doc. B – see p.2, 26-27:

Sprinkl-eeze Pro ('P')

Sprinkl-eeze lite ('L')

Infringing acts:

MO for sure, presumably K (maybe I) and soon to be D

Claim 1

		P		L	
1.1	✓	P.11, 5-13 and P.12, 5-10 ✓	✓	P.12, 5-10 ✓	1
1.2	✓	P.12, 5-10. They are supplying a sprinkler, and p.2, 17-18 Aspects of claimed sprinkler frame are commonplace. TRM = the P itself✓	✓	P.12, 5-10 (same as) ↵ "glass bulb breaking" for both cases, i.e. L & P Thus TRM = L✓	1
1.3	✓	P.12, 5–10	✓	P.12 5-10	
		(Note construction✓ doesn't require inclusion of source of✓ FEF)			1
1.4	✓	P. 12, 5-10	✓	P.12, 5-10	
		"glass bulb retains valve member in closed position" ✓ ✓			1

		P		L	Examiner's use only
1.5	✓	P.11, 1-13 PC and water. PC melts @ 60°C, which is lower than actuation temp✓ (see p.11, 6-8) Expansion to break bulb: p.11,✓ 10-13 (both fluids) Note if narrower const. of fluids was adopted → limited to CH & DMF, No infringe → PC is used.	X	P.11, 32-35 "absent water" Just PC. Only✓ 1 fluid – per my const. air bubble doesn't count as one of the fluids.✓	0.5 0.5 0.5 0.5
1.6	?✓	Assume so, on balance of prob. P.11, 15-17 implies ~ 1 sec @ 80°C, seems likely to be < 12 @ 75. ✓ Check this though! ✓ For same reason < 7 seems v. likely at 125.	✓	P.11, 32-35 < 12 @ 70 & < 7 @ 80✓ So, < 12 @ 75 & < 7 @ 120✓ seems likely.	0.5 0.5 0.5 0.5
Overall	✓	Infringed on balance of prob for 1.6 (✓)	X	Not infringed per (✓)1.5. (Note if construed to include gas as a fluid, L would infringe claim 1).	
2.1	✓	See claim 1(✓)	X	See claim 1(✓)	
2.2	✓	Per my construction @ actuation T. p.11, 10-13 "water" and "PC" (melted). Note @ higher T water may be vapour, but still a fluid.✓	X	Only PC, no second fluid.✓ (would infringe if diff const. of bubble)✓	0.5 0.5 1
Overall	✓	Infringed(✓)	X	Not infringed (irrespective of dependency on claim 1).(✓)	

					Examiner's use only
		P		L	
3.1	✓	See claims 1 and 2(✓)	X	See claims 1 and 2(✓)	
3.2	✓	See p. 11, 15-18 Seems operating conditions such that water is in liquid phase. Then, see figs on p. 10 – clearly not mixed✓	X	No two fluids. Anyway, certainly not 2 liquids irrespective of bubble construction✓	0.5 0.5
Overall	✓	Infringed(✓)	X	Not-infringed irrespective of dependencies (or bubble const.) (✓)	
4.1	✓	See claims 3, 2 & 1(✓)	X	See any of claims 3, 2 & 1(✓)	
4.2	?✓	Can't say for sure, but on balance of probs – Yes. See fig (on right) on p.10 PC is denser (p.11, ✓5-8) and given it melts @ 60°C, also likely to boil @ higher✓ T than water.✓	X	No 2 liquids✓	0.5 0.5 0.5 0.5
Overall	✓	Probably infringed(✓)	X	Not infringed, irrespective of dependency.(✓)	
5.1	✓	See claim 1(✓)	X	See claim 1(✓)	
5.2	X	See figs on p.10 – no pointed end✓	✓	See figs on P.11 – Top is pointed need to check if that is "upper" in use Seems likely based on fig. orientation. ✓	0.5 0.5
5.3	X	No pointed end	✓	See figs on p.11	
Overall	X	Not infringed(✓)	X	Not infringed but only by dependency on claim 1 (if bubble const. diff. then infringed.) (✓)	

		P		L	Examiner's use only
6.1	X	See c.5(✓)	X	See c.5 or c.1(✓)	
6.2	?X	Per my const. Can't tell – figures don't show thickness No reason to assume non-uniformity in thickness of bulb so on balance of prob – not present✓	X	Same as ↵✓	0.5 0.5
Overall	X	Not infringed(✓) (probably irrespective of dependency)	X	Not infringed (✓)	

Dependencies 2
Conclusions 2

MARKS AWARDED 19

Doc D is novelty only prior art. Doc C is full prior art. ✓ 1

Was there any public disclosure of the bulb of Doc D before March 2012? If yes, then relevant for inventive step.

Doc C – Novelty

2 embodiments: Standard ('S')
Bespoke ('B')

Claim 1

		S		B	
1.1	✓	Implicit – fire suppression catalogue✓	✓	"activation profile …"	0.5
1.2	✓	"for standard installations – p.2, 16-18 – frame commonplace✓	✓	Same as ↵	0.5
1.3	✓	Implicit. (see e.g. p.3, 18-20) operation the same✓	✓	Same as ↵	0.5
1.4	✓	Implicit, same logic as ↑✓	✓	Same as ↵	0.5

		S		B	Examiner's use only
1.5	X	"OR" – no combination. See fig. remaining 5% likely to be air – not a fluid per my const. can't say what is in circle✓	✓	Arguably, yes "homogenous blends" – more than q	0.5
1.6	X	Seems unlikely based on 15@77 and 10 @ 120✓	X	No disclosure of actuation times	0.5
Overall	X	Novel per 1.5 and 1.6(✓)	X	Novel per 1.6	
2.1	X	See claim 1(✓)	X	See c. 1	
2.2	X	Only 1 fluid in play (would be disc. per diff. const. of bubble✓)	✓	blends of standard liquids ↳ seems plausible to be liquid @ act. Temp.	0.5
Overall	X	Novel irrespective of dependency(✓)	X	Novel only by dependency	
3.1	X	See claim 1 or 2(✓)	X	See claim 1 (or 2)	
3.2	X	No two fluids✓	X	Per my const. They are 'blended' → mixed✓	0.5 0.5
Overall	X	Novel(✓)	X	Novel (irrespective of dependency).	
4.1	X	See any of 1, 2 or 3(✓)	X	See 1, 3 (or 2)	
4.2	X	No two fluids✓	X	Arguably implicit, i.e. activation profiles but blended → likely to have similar density	0.5
Overall	X	Novel(✓)	X	Novel (irrespective of dependency)	
5.1	X	See c. 1(✓)	X	See c. 1	
5.2	?X	Has the right shape, but based on fig. have to conclude pointed is the lower end✓	X	No pointed end	0.5
5.3	X	Air bubbles at other end	X	No pointed end	
Overall	X	Novel	X	Novel Irrespective of dependency.(✓)	

		S		B	Examiner's use only
6.1	X	See claim 5 or claim 1(✓)	X	See claim 5 or claim 1	
6.2	?X	See fig and my const. It is thinner but rounded end is upper.✓	X	Uniform thickness implied – no pointed end	0.5
Overall	X	Novel	X	Novel Irrespective of dependency.(✓)	

Document D

One embodiment

Claim 1

1.1	✓	p.14, 2-3✓	0.5
1.2	✓	Implicit sprinkler will have a frame – TRM = member 1✓	0.5
1.3	✓	Implicit see p. 3, 18-20. This set-up is known✓	0.5
1.4	✓	Same as 1.3✓	0.5
1.5	X	Only one fluid – 6 is solid @ actuation (p. 15, 10-15) Air bubble doesn't count. ✓	0.5
1.6	✓	Seems likely – p. 15,29. If it is < 10 @ 70, < 12 @ 75 & < 7 @ 120 seems reasonable. ✓	0.5
Overall	X	Novel part 1.5. Note diff const of bubble → not novel. (✓)	
2.1	X	See claim 1(✓)	
2.2	X	No two fluids.✓	0.5
Overall	X	Novel. Irrespective of dependency(✓)	
3.1	X	See claim 1 or claim 2(✓)	
3.2	X	No two liquids.✓	0.5
Overall	X	Novel. Irrespective of dependency. (✓)	
4.1	X	See any of claims 1, 2 or 3. (✓)	
4.2	X	No two liquids. ✓	0.5
Overall	X	Novel. Irrespective of dependency. (✓)	

			Examiner's use only
5.1	X	See claim 1(✓)	
5.2	✓	See fig. 1. Air bubble @ bottom end indicates that end likely to be top (note in ref c. there were bubbles @ the top end in the pic) Therefore upper and lower for pointed and rounded are✓ satisfied	0.5
5.3	✓	See fig. 1 on p.16✓	0.5
Overall	X	Novel, only by dependency.(✓)	
6.1	X	See claim 1 (or claim 5)(✓)	
6.2	X	See fig. 1, p.16 – bulb thickness is uniform.✓	0.5
Overall	X	Novel, Irrespective of dependency.(✓)	
		Dependencies	1
		Conclusions	2
		MARKS AWARDED 16	

Inventive Step

Doc D is novely-only art. Not considered for inventive step. Although, it would be✓ if there was a public disclosure – check this. I have to assume no, so will only consider doc C. If D were considered the only applicable teaching would seem to be of non-mixing in the bulb, and one having substantially lower thermal expansion coefficients that the other. Could be relevant, but stick to my view of not considering it. 1

Use pozzoli

PSIA taken to be a designer of bulbs [In set up]✓ for sprinklers. Given the sprinklers have been "known for ages" – p. 14, 10 or p.3 14 to 20. It seems reasonable that PSIA specialises in bulbs rather than just(✓) sprinklers. 1

Their CGK – knowledge of such sprinklers, e.g. as set out on p. 3 (also – p. 2, 8-18) (Note – if my implicit features for novelty were considered not present, based on this CGK, they would certainly be obvious.) Is bespoke bulb(✓) CGK? It was never manufactured – p.2, 43 & 44 – PSIA may never have been aware. However, I will consider it CGK as it is an extract from "the Universal Fire Suppression system catalogue." It seems likely PSIA would read this. 1

	Examiner's use only
Claim 1	
Inventive concept is a sprinkler with a TRM bearing against a valve and containing two fluids one of which such that, when exposed to heat, will expand so that the TRM will break to allow flow of FEF, wherein the actuation time is < 12s @ 75°C & 7s @ 120°C. ✓	0.5
The standard bulb of Doc C will be taken as closest prior art. The difference between the inventive concept and this is the use of two fluids contained in the TRM, and the specifics of the actuation time. ✓	0.5
I think these differences would be obvious to PSIA in view of CGK. In particular, when considering the bespoke bulb. Because, the bespoke bulb clearly teaches a benefit of using two fluids – "bespoke✓ activation profile". Thus PSIA would be aware that (see p.3, 28 and 29) this specific profile would be desirable to control & thus they would seek to do so using the teaching of two fluids from the bespoke bulb. Thus, the PSIA would then consider what profile to adopt, i.e. what actuation times to look for. PSIA would be aware speed is important, p. 3, 28, and given that the two fluids mentioned for the standard bulb are the same as those used in the patent, it✓ seems inevitable they would, through basic experiments, arrive @ a mixture satisfying the requirements of claim 1.✓ Thus, it is considered that claim 1 is obvious in view of Doc C and CGK.	1 0.5 1
Claim 2	
The inventive concept (and difference between this claim and standard bulb (2 + 1)) added by claim 2 is that one of the fluids is a liquid. This would seem obvious to PSIA, as by implementing the teaching of the bespoke bulb, PSIA would be using liquids, and as per table on p. 7 would expect at least one (see comments in sufficiency) of the fluids to still be a liquid @ actuation temp. ✓	1
Thus, claim 2 seems obvious.	
Claim 3	
The inventive concept of claim 3 (+ 2 + 1) is that the two fluids are liquid and immiscible. The difference this adds to that between this and standard bulb is that the liquids are immiscible. This provides advantages set out on p. 4 21-25, which I don't think would be obvious to PSIA. This is because the teaching leading PSIA to using two liquids (bespoke bulb) teaches homogenous✓ blends. This is teaching away from immiscible fluids.	1

	Examiner's use only
Thus, claim 3 is considered inventive. Note, there is a reasonable argument that if doc D's teaching was available for inventive step, this claim may be considered obvious. <u>Claim 4</u> The inventive concept added by this claim is to have one fluid with lower boiling point and density. This would seem inevitable given PSIA would use teaching of standard bulb (i.e. CH & DMF) and would thus be expected to arrive✓ at this feature. (see table on p.7).	1
Thus, claim 4 (+3+2+1) not obvious except by virtue of dependency on claim 3. <u>Claim 5</u> Inventive concept is upper pointed end and lower rounded end wherein upper end accomodates a bubble. Difference is the shape. However by using standard bulb the other way round, one would arrive✓ at this configuration. This does not seem an inventive step. I do not think the teaching of bespoke bulb having no air bubble would have to be implemented and thus PSIA could modify standard using CGK to arrive at claim 5.	0.5
Thus, claim 5 obvious. <u>Claim 6</u> Inventive concept relates to wall thickness between the two ends being thinner. As can be seen in fig of standard bulb, turning this bulb upside down would ✓ satisfy this claim requirement, and so this does not seem to add an inventive step.	0.5
Claim 6 obvious. **MARKS AWARDED 10.5** <u>Sufficiency</u> See p. 3, 25-26 and p. 5, 14-21. It✓ seems the choice of fluid is critical. However,	1
only really scope to rely on use of CH and DMF as teaching for how to✓ actually implement the invention. As my construction encompasses use of other fluids e.g. water or gas, may bring sufficiency into question. Post-filed data a possibility – is it plausible others could have been used?	1

	Examiner's use only
See table on p. 7 – CH boils @ 81°C ↳ but we work upto 120°C in our claim → this may also add a sufficiency issue to use of liquid in the claims, as per my construction. However, not clear @ what Pressure that is boiling. P is likely to be high in the bulb, and so CH could well be liquid still → expert advice needed?	
MARKS AWARDED 2	
<u>Amendment</u>	
Amend claim 3 so that "third species" reads "second species". This should be allowable. It is a correction. Obviously not what was meant, rather, obvious it was meant to say second.	
Amend claim 1 – "species" to "fluids" and other instances of "species" occurring in the claims (2, 3). This should be allowable as two words are used interchangeably in spec, so obvious that was what was meant. Basis would thus be okay, and wouldn't broaden post-grant.	
Amend claim 1, anticedence, "the" to "a" for✓ actuation time.	0.5
MARKS AWARDED 0.5	
<u>Letter to client</u>	
<u>Entitlement / ownership</u>	
What was the agreement to sell? Was there a signed assignment? If so, did you register the assignment? ✓	1
You can't bring any action if you don't own the patent. Especially not against the patent owner. Thus, need to make sure you own it.	
If no assignment, bring entitlement action, (s.8) as your brother is unlikely to sell you the patent now. This assumes you were the inventor and he wasn't or both inventors, but paid to invent (course of✓ normal duties) and so the employer, i.e. your business, is the owner. Bring this action ASAP, but certainly before September 2018 as, if you can't prove he was aware he should not own it, then it will be too late. However, do ASAP regardless, as you will need it for enforcement.	1
If you end up as co-owners you won't be able to enforce it against him as he would also be a co-owner. In which case, there's not much you can do. Would have to rely on proving he intended to sell, and assign, patent to you – likely to be hard without solid evidence. ✓	0.5

Examiner's use only

Check status of renewals – bro likely to have let it lapse, and thus Dec 16 renewal likely missed (and grace period) and Mar 17 ren (and grace period) → will need to restore – by June 18 but do✓ so ASAP, as third party rights can accrue. Need patent to be in force, and you to own it, to bring an action (as current owner, your brother certainly wouldn't let you use it to sue him). 1

Regarding status of patent, I think several amendments are required, see "amendment" section. Also, I recommend amending claim 1 to include claims 2 and 3, which I think should give a valid claim (see comments on sufficiency – do they seem reasonable concerns?).

Then, I think the Sprinkl-eeze pro would infringe, but the Lite would not. I understand you are likely to be happy with this as you consider the domestic market too small to be of interest.

<u>Actions</u>

Need to make sure you own the patent and that it is in force. If my suspisions about renewals are true, then it is unlikely you will be able to do anything given he will have (seemingly in good faith?) made serious and effective preparations to "infringe" (use), for which he will be allowed to continue.

If patent is granted and in force and owned by you, I recommend filing for an interim injunction to the Sprinkl-eeze pro. Do So ASAP, else you undermine its need. Any post-grant amendment would have a 3 month opp period which takes you to past their Nov launch. As there is a serious case to be tried, and it is having a significant impact on your business, it seems balance of convenience, and maintaining status quo, would be in your favour, so chance of success✓ would be reasonable. 1

A full infringement action may be overkill given he's not started selling yet. However an infringement opinion from UKIPO may be a sensible cost-effective solution.

Given bad blood, seems unlikely he'd take a license (or cross-license for his patent apps Set-up a watch for these). However, you may want to consider approaching Big Bulbs r.e. a license to their bubble-free filling technology. Seems this may benefit you. ✓ 0.5

MARKS AWARDED 5