

## Document A

## SPARE SET OF CLAIMS OF THE PATENT

1. /A system for providing electrical power<sup>1.1</sup> to a road vehicle/~~the system~~  
comprising at least a pair of gantries and an/~~overhead cable supported~~  
by a carrier cable extending from the<sup>1.2</sup> gantries at an elevated position/~~the~~  
gantries each having<sup>1.3</sup> a support leg for engaging the ground either side of  
a road and a beam spanning the road between support legs/~~the overhead~~<sup>1.4</sup>  
cable being connected or connectable to a supply of electricity/~~a first end~~<sup>1.5</sup>  
of the carrier cable being rigidly secured to a first of the gantries/~~a second~~<sup>1.6</sup>  
end of the carrier cable being secured to the second gantry by a resilient  
biaser arranged to generate tension in the carrier cable./<sup>1.7</sup>
2. /A system according to Claim 1/~~wherein the cable has a core and a sheath/~~<sup>2.1</sup>  
the core being formed of a first material/~~and the sheath being formed of a~~<sup>2.2</sup>  
second material./<sup>2.3</sup> <sup>2.4</sup>
3. /A system according to Claim 1/~~wherein the resilient biaser is a spring./~~<sup>3.1</sup> <sup>3.2</sup>
4. /A system according to Claim 3/~~wherein the resilient biaser is secured to~~<sup>4.1</sup>  
the gantries via a flexible connector/~~and is rigidly secured to a first end of~~<sup>4.2</sup>  
the carrier cable./<sup>4.3</sup>
5. /A cable for carrying electricity, particularly in an overhead power system/~~the cable~~<sup>5.1</sup>  
comprising a core and a sheath/~~the core being formed of a~~<sup>5.2</sup> <sup>5.3</sup>  
relatively conductive material/~~and the sheath being formed from an elastic~~<sup>5.4</sup>  
material/~~the core having a cross section which is not circular./~~<sup>5.5</sup>

## CONSTRUCTION

1.1 A system = an apparatus (p5, 18) that includes the features recited. Sets the scene and defines C1 as an independent system, ie apparatus/device, claim

 $\frac{1}{2}$ 

for = suitable for

 $\frac{1}{2}$ 

providing electricity to a road vehicle = Supplying electricity to a "road-going vehicle" (p2, l 1–2). Road-going vehicles include trains and trolley-cars (p3, l35 and p5, l 8–9). Not necessarily limited to such as this the specific embodiment. Trains unlikely to be considered "road-going" so not road vehicles.

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∴ 1.1 sets scene, defined field of invention as a system/apparatus for supplying road-going vehicles

1.2 the system comprising = including the following recited features, but not limited to those.

at least a pair = a minimum of two, but at least  $\Rightarrow$  could be more. ie two or more. P5, l 9 says "plural gantries" that are located along roadway. The patent implies pairs are with respect to down the roadway, rather than along it

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gantries = term of art?; used in PA (doc D). "Span road to provide a through-path to allow trams/trolley-cars to use road 2" - p 5, l 10-11. Gantries support the OHE and carrier cables (p5, l 15–19). Doesn't include buildings (p4, l 1–3) – see "buildings ... OR gantries).

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∴ 1.2 = two or more gantries, where gantries = separate support structures that support OHE/carrier cables and define a road there beneath.

1.3 an overhead cable = "OHE cable" known in art – see p3 describing PA. overhead in the sense that they are overhead of the vehicles to which electricity provided – see p3, l 7–10. OHE cable carries electricity to be supplied to vehicle (p3, l 10-11) Suspended above vehicle (p3, l24-25). Cross-Section / construction of overhead cable not limited - see C2 which further defines as having core + sheath. C1 is broader by definition and doesn't necessarily include core + Sheath.

 $\frac{1}{2}$ 

cable = something suitable for carrying electricity + supplying to vehicles (p3, l 10-11).

Supported by = “carried by” (p5, l 16) another, separate cable. Specific embodiment Shows OH cable supported below carrier cable (Fig 2). This is specific embodiment and so not necessarily limited to such configuration. P3, l 19 = “typically suspended by” ie to hold it below. Again, C1 not limited to this and broader. Just needs to hold in current place, that is, above the vehicles.

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a carrier cable = is a separate structure to OH cable and seems to support the OH cable – see p5, l 15–18 and Fig 2. Function of carrier cable is to allow the OH cable to be positioned approximately. and for holding in place.

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extending from the gantries = how does it extend and in what direction? Specific embodiment shows extending below the rigid beam 5 of gantries 3 (see Fig 2) – but is this needed? Probably not. The carrier cable only needs to be supported by fixed gantry structure and can extend in any manner provided that OH cable is located in correct place. So, carrier cable could extend laterally or longitudinally from the gantries – ie from either support legs or beam.

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at an elevated position = What is elevated and with respect to what? Specific embodiment shows that carrier cable is higher in elevation than OH cable 8 (Fig 2). The elevated position clearly refers to the elevation with respect to roadway 2 below. ∴ SP would conclude that OH cable is supported by separate cable, at an elevated level above the roadway

✓

1.4 each having = each comprising, again not limited (see 1.1)

a Support leg for engaging the ground either side of a road = Specific embodiment has a pair of ground engaging legs 4 (p5, l 13-14). The Support legs must extend generally upwards from road to allow carrier cable to suspend OH cable above the road. Support leg either side of road ⇒ there is a first support leg and a second, corresponding, support leg at other side of road. Fig 2 reaffirms this. .

✓

for engaging the ground = Suitable for engaging ground.

and a beam spanning the road between support legs = a beam which extends between the two supporting legs at each side of road - Spans the road (p5, l 10–11) Beam Supports the weight of cables (p5, l 13–14)

∴ 1.4 = gantries Span the road from one side to other to provide a through –path (p5, l 10-11) – includes, in each gantry, a support leg at either side of road and a beam connecting the legs above the roadway, the beam allowing for support of cables above vehicles below.

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1.5 OH cable being connected or connectable to supply of electricity = connected or connectable ⇒ claimed when connected and when not connected. Only needs to be configured to allow for connection to supply of electricity.

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1.6 a first end of the carrier cable = one of the ends - not necessarily the terminal end (see Fig 2 – p 5, l 15–19). The first and in specific embod is at gantry 3B, ie mid-way between gantry. However, could be terminal gantry.

being rigidly secured to a first of the gantries = rigidly secured implies some lack of resistance and/or movement. Confirmed in Specific embod (p5, l18 – fixedly secured). In Specific embod this “first end” is fixed secured by rigid arm support 8.

✓

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∴ 1.6 = at one end of carrier cable, not necessity a terminus, it is fixedly secured to one of the gantries. (ie restricted motion)

Other

– also, see p4, l 17–19 – describes non-rigid connection as “to allow relative motion” thus, converse applies here for rigidly – ie restricted motion.

✓

1.7 a Second end = the second end of the carrier cable, ie other end other than the list. Again, not necessarily the terminus, but could be.

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being secured to the second gantry = normal meaning – Secured so as to not be readily removable from the Second gantry of the pair

by a resilient biaser = resilient implies it returns to its natural Shape after force applied + released. See p5, l 24–30. Biaser = Slightly unclear – what does it bias? In this case it provides tension to the carrier cable and so biases in such a way this is achieved – provides appropriate level of tension (p4, l 9–10) Preferably a spring – p4, l8 and C3 – but C1 is broader than C3 by definition and therefore broader than “a spring”. Most preferable it is a constant force spring, rather than helical spring ,but can be either (p4, l 12–13). Thus, resilient biaser only needs to generate tension in

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	Examiner's use only
carrier cable – See last part of claim. <b>one unclear word</b> by this function and includes springs, constant force springs and helical springs.	✓
2.1 = all of the features of C1 plus those recited	✓
2.2 The cable = which cable? From description and spec embod. Sensible to rate this as OH cable rather than carrier cable as Figs 4A–4C describe OH cable with core + “Sheath”.	½
has = includes/comprises, not limiting a core = a central part that is conductive– see p5, l 42. The core is conductive to allow electricity to flow to vehicle – see p5, l 46-47 – “contact surface” for electrical contact. Can be Cu or <b>one unclear word</b> alloy, but this is optional.	½
and on Sheath = described as a coating (p5, l43) or a cover (p4, l27-28). Generally surrounds the core to provide a protective surface against clamping (p5, l44–46). Doesn’t need to entirely surround core, indeed can’t as needs to be a contact surface.	½
2.3 = Core is of a first material	✓
2.4 =Sheath is of second material	✓
2.3/2.4 imply the core + Sheath are constructed from different materials? (Confirmed by specific embod – see p5 last para. However, specific embod shouldn’t limit this claim ∴ can be of same/different material	
∴ C2 = OH cable includes a core that is conductive and a protective cover, when core + Sheath are of different or Same materials.	✓
3.1 = includes all features of C1 and those recited.	✓
3.2 = describes resilient biaser as a spring. Still broad enough to cover both helical and constant force springs in p4 l 11–12	½
4.1 = including all of the features of C3 (and thus features of C1) plus those recited	
4.2 = resilient biaser is described as Spring in C3 – so C4, as dep on C3, includes limitation that resilient biaser is a Spring	
is Secured to gantries via a flexible connector = resilient biaser only secured to one of the gantries (see Fig 2) but could Secure to others further down the system.	½ ✓

Flexible connector = allows for some movement, ie a non-rigid connector (p4, l 18). Preferably a ball-and-socket (see 13 in Fig 2 / p5, l40) but not limited as Such. Just needs to allow relative motion.

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4.3 rigidly secured = a rigid connection that restricts motion. at a first end = is this a new first end or “the” first end of C1 – The first end of C1 wouldn’t make sense. P4, l 17–19 only says connected to “an end”. Sensible to take this “first end” to actually be the Second end of C1 – in which the resilient biaser is attached. ie resilient biaser at Second end of carrier cable; rigid connection to gantry at first end of carrier-cable.

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∴ C4 = a spring is secured to the gantry by a flexible, non-rigid connector, and is connected to carrier cable by a rigid connection.

5.1 a cable = new independent claim. Of any similar Suitable size/material to carry electricity

✓

for = Suitable for

carrying electricity = the cable is for carrying electricity, ie what is referred to as OHE cable in the specification.

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particularly in an overhead power system = this is merely a particular use and is not limiting on C5.

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5.2 See 2.2, Same applies

5.3 being formed of = comprises or constructed from

relatively conductive material = relatively? How “conductive” does it need to be? Must allow electricity flow or simply wouldn’t work. Conductive = is this thermally /electrically or something else? Clearly in context of spec it’s electrically conductive: See last para, pg 5.

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5.4 The Sheath is formed from an elastic material. That is, the material must have Some sort of elasticity. Rubber given as Specific example (p4, l 27 + p 5, l 45). Not limited to rubber though. Elastic perhaps implies some sort of resilience or flexibility in the material.

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5.5 • Core has a cross-Section that is a Shape that does NOT include a circle. ie not a circular cross-section. examples in Spec embod include rectangular (Fig 4c); pentagonal (Fig 4B and hexagonal (Fig 4A). Order of pref: rectangular > pentagonal > hexagonal

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Cross Section refers to core only – So could Sheath have different cross-Section? Not sure patentee intended this.

- ∴ C5 = a cable suitable for carrying electricity, the cable being a core of electrically conductive material and a sheath of elastic material. The cross-section of the core is something other than circular.

dep ½

14

**MARKS AWARDED 14**

### INFRINGEMENT

- 1.1 ✓ – new system for supplying electrification for modern trams along roads – ie system for supplying electricity to road vehicles (p11, l 2; 4; 6). ½
- 1.2 ✓ – Single gantry at each terminus – ie a pair of gantries, “as with all tram systems”. p11 l 30–31  
Buildings NOT one unclear word as gantries ½
- 1.3 ✓ – See “Street view”, p12: carrier cable with support for OHE cable. Given that gantries are terminal ends– the carrier cable extends from one gantry towards the other terminal gantry. The carrier + OHE cable are suspended at elevated position - Thus 1.3 present accounts to construction. ½
- 1.4 ✓ – 2x legs that are suitable for engaging either side of roadway, have a cross member connecting the two (ie beam = cross-member) See p11, l 30 – 35. ½
- 1.5 ✓ – p11, l 31 - at each terminal gantry the electrical connection is made ½
- 1.6 ✓ – before the final terminal gantry, the carrier cable would be rigidly attached /Secured to suspension cable as shown in plan view. ½
- 1.7 ✓ – at the the terminal gantry, ie the second end of the carrier cable, the carrier cable, attached to suspension cable, is connected to one leg of gantry by spring; and to other by Static connection (p11,l 32-35) Thus, a resilient biaser (a spring) is arranged to generate tension (Spring which to generate tension – p 11, l 17). ½  
½  
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- ∴ C1 is infringed.

- 2.1 ✓ – all features of C1 present – see above
- 2.2 ✓ – it is coated and therefore must have a sheath (coating) and a core (for conducting electricity). See p11, l 36-37
- 2.3 ✓ – although not confirmed, it is implicit that core is of a first material
- 2.4 ✓ – the coating is likely a different material – but check. If it's of same material is it a coating? Coating = different material ∴ present.

∴ C2 is infringed.

- 3.1 ✓ – all features of C1 present
- 3.2 ✓ – “our System uses small springs ... to maintain tension” p11, l 17 + Springs used to connect to gantry at terminus (p11, l 33)

∴ C3 is infringed.

- 4.1 ✓ – all features of C3 + C1 present
- 4.2 ✓ – Spring is connected to anchor bolt via high connection
- 4.3 ✓ ↳ which is a flexible connector (see p13). Also connected rigidly at end end (see p13)

∴ C4 infringed.

- 5.1 ✓ – p11, l 36 – new coated cable; implicit for carrying electricity
- 5.2 ✓ – coated ⇒ a coating and a core
- 5.3 ✓ – implicit as must have electrically conductive material in order to work - it contacts vehicles (See Street view) thus implicitly present
- 5.4 ? Insufficient information to determine if it is of elastic material. Need to obtain information.
- 5.5 ✓ cross-section is Square, thus not circular, so present

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∴ if coating is of elastic material, C5 is infringed.

So for C1–C4: Mez making the SyStem will be an infringement; local authority Using so infringe

Examiner's use only
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✓
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✓

12

MARKS AWARDED 12

NOVELTY – doc C

Published Jan 2010 - before patent's priority date ∴ full PA.

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1.1 X – doc C discloses thread for Smart clothing (p14, l 4–5). Although heavier duty (thicker gauge)  
Materials can be used – they would not be Suitable for Supplying electrical power to road vehicle.

1.2 X – no gantries

1.3 X – as above, no gantries

1.4 X – as above

1.5 X – no OH cable

1.6 X – no gantries/carrier cable

1.7 X – no resilient biaser.

∴ C1 novel. C2–4 novel by virtue of dependencies, but nevertheless:

2.1 X – C1 not disclosed

2.2 ✓ – thread, if regarded as cable, has a core (conduction) and a polymer coating (Sheath)

2.3 ✓ – Core of conductive material

2.4 ✓ – Sheath of polymer material  
↳ ie Second if different material

∴ C2 novel by virtue of dependency, but S-M may be bad for lack of novelty otherwise.

3.1 X – C1 not disclosed

3.2 X – no resilient biaser or Spring

∴ C3 novel by virtue of dependency + S–M also novel

4.1 X – C3 not disclosed. Nor is C1

4.2 X – no resilient biaser

4.3 X – as above

∴ C4 novel, S-M + by virtue of dependency.

- |   | Examiner's use only |
|---|---------------------|
| 5.1 ✓ – C5 not limited to OH power system – thread could be regarded as cable for carrying electricity (p14, l 10 - effectively carrying current)   | ½                   |
| 5.2 ✓ – conductive core (core) + polymer coating (Sheath) – see figs on p 14.   | ½<br>½              |
| 5.3 ✓ – it is of “conductive material” and has the ability to carry electrical current. See figures of doc C.   | ½                   |
| 5.4 ✓ – there is flexibility within the thread – thus the polymer coating must be of elastic material. See – p14, l 13 – increases bending resistance, and p14, l10 not interfering with flexibility. | ½                   |
| 5.5 ✓ – cross-section (see fig on p14) IS rectangular, NOT circular.  | ½                   |
| ∴ C5 not new in view of doc C   |                     |

NOVELTY – doc D

pub Oct 1980 - one unclear word product priority date, So full PA

- |  |        |
|--|--------|
| 1.1 ✓ – discloses electrification projects for railways – thus would also be suitable for road vehicles, as well as trains. See p15, l3-4 + l 15–17.   | ½      |
| 1.2 ✓ – a series of gantries (p15, l16)  | ½      |
| 1.3 ✓ – OH cable suspended for carrier cables (p15, l16–17)  | ½      |
| 1.4 ✓ – In view of CGK of SP - gantries do have support legs suitable for engaging at each side of road; and a beam spanning between. Gantries known in 1980 – SP knows gantry = legs + beam, unlike pylons. | ½      |
| 1.5 ✓ – trains contact overhead cables to receive electrical power – thus on cables must be, at least, connectable to electricity supply (p15, l17-18)   | ½      |
| 1.6 X – no disclosure of a first end of carrier cable being rigidly secured.   | ✓      |
| 1.7 ✓ – Spring mechanism in doc D can be regarded as a resilient biaser as construed – it grants a tension (ie takes place of traditional pulleys – see p15, l 29-31)  | ½<br>½ |

∴ C1 is novel over doc D.



INVENTIVE STEP

Using Windsurfing/Pozzoli for I.S. for all claims:

SP = manufacturer as designer of electrification systems doe road-goaing vehicles or vehicles more generally

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CGK = applying electrical power through rail to a vehicle (p3, l5); providing electrical power through OH cable located between pylons (p 3, 18-9); using pantographs on vehicles for “piling up” electrical power (p3, l 10-11; p2, 18-10); using gantries for OHE cables (p15, l 16); using carrier cables and dropper wires ( p3, l19–20).

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C1

I.C. = A system for providing electrical power to road vehicles that provides tension to the overhead cables without using tensioning weights.

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Diffs over PA = document C is silent on Such a system entirely. Document D fails to disclose a list encl of a carrier cable that is rigidly secured to a first of the gantries.

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Obv? Document D is only stating point – doc C not concerned with S-M of C1

✓  
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The patent describes that it is the combination of the above **one unclear word**, with the resilient biaser, that provides the improvement over the PA. The SP has no motivation to provide a rigid connection at one end and a resilient biaser at the other. Absent any teaching, the SP is unlikely to furnish the claimed invention **one unclear word** doc D above. Using CGK, it is known to use pulley systems to provide tension, but nowhere in the CGK is it mentioned that a combination of rigidity + resilience provides the desired tension. Thus, I believe C1 to be not obvious.

✓  
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✓  
1

C2

I.C. = a cable for a system to provide electricity to road-going vehicles that can be clamped more readily (p4, l27-28)

Diffs = no disclosure of the Content of C2 in doc D. Doc C discloses the generally S-M of C2, though not in the context of a electrical system.

Obv? Document C resides in a different field. However, doc C was referenced in Clients’s industry magazine. and so SP would be aware of existence of doc C

The disclosure of doc C relates to providing flexibility with electrical conducting fibres/threads. Although patent not concerned with imparting flexibility, the side elevation of Doc C could give the SP motivation to use in this field – there is an exposed portion for electrical contact, much like that Shown in Figs 4A-4C of patent. (Also, – p14, l21 says “whole face can be removed). Therefore, the SP may apply thus teaching to a cable in our field, and if they do, they would arrive at C2’s S-M. Thus, the S-M of C2 may be considered obvious.

### C3

I.C. = as construed – a resilient biaser for a electrical power system for road-going vehicles

Diffs = doc C describes disclosure of resilient biaser; doc D describes a Spring (ie S-M of C3).

Obv? Doc D to clearly aimed at a solving a similar problem as patent. It uses a Spring as a resilient biaser to do so, despite continuing to use a weight - by doing so, mechanical **one unclear word** of pulley system mitigated. With knowledge of doc D, the SP would try a spring as a resilient biaser and thus would arrive at S-M of C3. Therefore, C3 may lack an inventive Step.

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### C4

I.C. = a resilient biaser that allows for relative motion with respect to carrier cable

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Diff = Securing resilient biaser to gantry via a flexible connector

Obv? Doc C not concerned with system. Doc D does disclose a Spring, but **one unclear word** To disclose/suggest a flexible connector to allow relative movement. In fact, doc D has a Spring that is held in place by **one unclear word** over the curved track, which is welded to gantry. There is no suggestion of allowing relative motion. In fact, It teaches the opposite – ie to restrict the motion of resilient biaser (see p16 last para). ∴ C4 is likely not obvious.

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### C5

I.C = a cable for supplying electricity to a road-going vehicle that improves contact with an electrical contact on vehicle, and improves clamping **one unclear word** between cable and carrier.

1

Diffs = doc D doesn't disclose any details about the OHE cable. Doc C is good Starting point + may be sought for reasons given in C2,

1

Starting from doc C, the SP is **one unclear word** to ask a conduction core with a polymeric coating. The overall cross-section is rectangular to move the thread more efficient (p14, 14-6). Implementing those teachings into an OHE cable would **one unclear word** S-M of C5, and thus render it obvious. However, as with C2, need to consider if this is feasible – check with client.

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∴ C5 may be obvious.

1

Note

- Warn client that obviousness Subjective and could go either way in court.

concl

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14½

**MARKS AWARDED 14½**

Sufficiency

- No immediate issues
- Would SP know what “resilient biaser arranged to generate tension” means? Most likely - arrangements given, that achieve this
- relatively conductive in C5 – what is it relative to? SP would read this simply as “conductive”. So Sufficient

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**MARKS AWARDED 0**

Amendment

C1: “and” to be included between “gantries” and “a second end” for clarity

✓

C2: change “cable” to “overhead cable” – clear this is what is intended

✓

C4: Spring resilient biaser is Spring for clarity, as dep on C3

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✓

C4 change “a first end” to “the Second end”.

✓

**MARKS AWARDED ½**

Advice

Summary

- C1 – 4 all infringed
- C5 infringed if coating is elastic material; otherwise not infringed
- C1 – 4 all novel; C5 disclosed in doc C ✓
- but question over obviousness of C2.
- Need to check – is polymeric material of doc C novelty displaying for elastic material? If not, check if obvious for C5 ✓
- Check if C2 obvious – would SP Seek doc C? any reason not to? 1
- C3 novel by virtue of dependency – be aware S–M is disclosed in doc D
- C4 look a good fall-back option as looks novel + inventive + infringed.
- Client has threatened infringer and told them not to use (ie asked to cease activity) so actionable ✓  
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- However, Mez infringes if they would have M the system and, potentially, U cable of C5 So defence to action against threat ✓
- could take infringement action after sending a pre-action letter. If successful at trial, remedies include declaration valid + infringed; damages OR account of profits; injunction; delivery up/destruction of infringing goods ½
- could offer a license – but doesn't appear appropriate for Mez. Offer one to local authority ½
- possible to apply for I.I. need to Show Serious **one unclear word** to be tried (likely here as infringing); damages not adequate remedy (wouldn't be – as compete on up-coming contracts + So damage to market position); and balance of convenience → appears possible here ½
- as Mez could be hurting client's market position. ½

3½

**MARKS AWARDED 3½**