

OPINION UNDER SECTION 74A

| | |
|---------------------|-----------------------------|
| Patent | GB2501515B |
| Proprietor(s) | Woo Sing Industrial Co. Ltd |
| Exclusive Licensee | |
| Requester | Atlas Lifting & Rigging |
| Observer(s) | Archer IP |
| Date Opinion issued | 30 April 2026 |

The request

1. The comptroller has been requested by Atlas Lifting & Rigging (“the requester”) to issue an opinion on the validity of Patent GB2501515B (“the Patent”), in the name of Woo Sing Industrial Co. Ltd, and also to issue an opinion on whether a design (“the design”) submitted by the requester would infringe the Patent.

Observations

2. Observations were received from Archer IP (“the observer”). The observations included arguments as to why the Patent was valid and why the design would infringe.
3. Observations in reply were subsequently received from the requester.

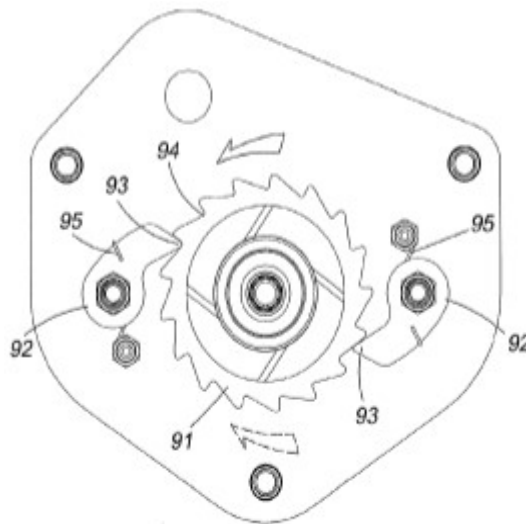
Preliminary Matters

4. In their statement of case, the requester has asked that validity be considered with regard to US 305,697. They have also stated that there has been ‘similar prior art’ cited during prosecution of corresponding applications in several non-UK jurisdictions, where issues relating to novelty and/or inventive step were raised. They have also provided a (PATBASE) document referring to corresponding applications, noting that Tiger Lifting Limited and Woo Sing Industrial Co. Ltd are commercially connected. The requester does not refer to or discuss any specific prior art other than US 305,697. Nevertheless, they request an opinion on the validity of the claims of the Patent ‘having regard to the prior art (including but not limited to US 305,697)’.
5. The opinion service is intended to be a relatively quick and simple procedure. However, it requires the requester to fully set out the facts that they wish to be

considered. In this instance the requester, beyond simply referring to 'prior art similar' to US 305,697 and 'novelty/inventive step objections' raised during prosecution of corresponding applications, has not provided any further details in this regard. The requester's actual arguments with regard to novelty and inventive step are restricted exclusively to US 305,697, and thus my opinion on the matter of validity will also be restricted to US 305,697.

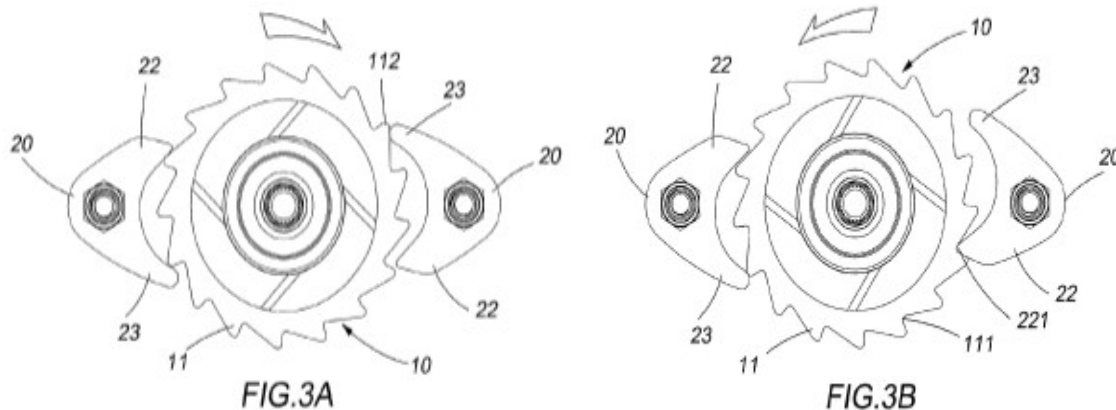
The Patent

6. The Patent was filed on 26 April 2012 and was granted on the 29 August 2018. The Patent aims to overcome problems with conventional ratchet braking systems which rely upon torsion springs 95 to keep pawls 92 in actuating positions with respect to the ratchet wheel 91 – so that when the ratchet wheel 91 starts backward rotation, i.e. counterclockwise, the tip portion 93 of each of a pair of pawls 92 is engaged to stop the ratchet wheel 91 from rotating backward. Such a conventional ratchet braking system is shown below.



7. The Patent provides a ratchet braking structure including a ratchet wheel 10 and a pair of pawls 20 located on opposite sides of the ratchet wheel 10. Each pawl 20 has a centre of rotation 21 and a pair of opposing end portions, wherein one end portion is formed as an engaging end 22 and the other end portion as a balancing end 23. When the ratchet wheel is rotated clockwise (see figure 3A) at least one of the engaging ends 22 or at least one of the balancing ends 23 of the pawls 20 remains in contact with the tooth tips 112 of the ratchet wheel 10. In particular, when an engaging end 22 is pushed outward by a tooth tip 112 due to clockwise rotation of the ratchet wheel 20, a leverage effect takes place such that the balancing end 23 of the same pawl 20 is tilted slightly toward the ratchet wheel 10. Soon after that, the balancing end 23 is pushed outward by the upcoming tooth tip 112. This allows the pawls 20 to be in constant contact with the ratchet wheel 10 in the absence of torsion springs. The moment the ratchet wheel 10 begins rotating backward, i.e., counterclockwise (see figure 3B), the engaging end 22 of one of the pawls 22 is readily brought into engagement with the nearest tooth valley 111 of the ratchet wheel 10, thus limiting further backward rotation of the ratchet wheel 10. As a result the balancing end 23 of the same pawl 20 swings outward and is brought out of contact with the ratchet wheel 10. However, as soon as the ratchet wheel 10 is

rotated clockwise, this balancing end 23 resumes contact with the ratchet wheel 10. Figures 3a and 3B from the Patent are reproduced below.



8. The Patent has seven claims, with a single independent claim 1, which reads:

A ratchet braking structure in a lifting device, comprising a ratchet wheel and a pair of pawls provided on two opposite sides of the ratchet wheel respectively, the ratchet braking structure being characterized in that:

each said pawl has a centre of rotation and a pair of opposing end portions symmetrically provided with respect to the centre of rotation, wherein one of the end portions is an engaging end for engaging with and thereby locking teeth of the ratchet wheel and the other end portion is a balancing portion for restoring a position of the engaging end; and

the engaging end of one of the pawls is diagonally opposite the engaging end of the other pawl.

Claim Construction

9. Before considering the issues identified in the request, I need to construe claim 1 of the Patent, that is to say I must interpret it in the light of the description and drawings as instructed by Section 125(1). In doing so I must interpret the claims in context through the eyes of the person skilled in the art. Ultimately the question is what the person skilled in the art would have understood the patentee to be using the language of the claims to mean. This approach has been confirmed in the recent decisions of the High Court in *Mylan v Yeda*¹ and the Court of Appeal in *Actavis v ICOS*².
10. In order to interpret the claims through the eyes of the skilled person, they must first be identified. I consider the person skilled in the art to be a mechanical engineer specialising in the design of ratchet braking devices.
11. The requester has highlighted the expressions “a pair of pawls”, “engaging end” and

¹ Generics UK Ltd (t/a Mylan) v Yeda Research and Development Co. Ltd & Anor [2017] EWHC 2629 (Pat)

² Actavis Group & Ors v ICOS Corp & Eli Lilly & Co. [2017] EWCA Civ 1671

“diagonally opposite” for claim construction. They also note that “symmetrically provided” and “a pair of opposing end portions” require consideration.

12. In my opinion the person skilled in the art would have little difficulty in construing “a pair of pawls”. A “pawl” is a term well known in the art as a pivoting means to engage with a ratchet wheel. “A pair of pawls” simply means two of these pivoting means.
13. What is meant by “diagonally opposite” in claim 1 is not specifically elaborated upon in the description. However, on the basis of what is shown in figures 2-4 of the Patent, and on pages 3-4 of the description (which refer to ‘upper’ and ‘lower’ positions), it is my opinion that it is reasonable for the person skilled in the art to construe “diagonally opposite” as – on the basis of a line connecting the centre of rotations of the respective pawls – the engaging end of one pawl being on one side of the line and the engaging end of the other pawl being on the other side of the line.
14. The requester notes that “symmetrically provided” is open to interpretation. Again, what is meant by “symmetrically provided” in claim 1 is not explicitly elaborated upon in the description – although I note that page 2 of the description discusses generally that the “ratchet braking structure is characterized in that each pawl has a balancing end extending from the side opposite the engaging end”. It is also apparent from figures 2-4 that the end portions (i.e. engagement 22 and balancing portions 23) of each pawl are not of exactly the same shape. Nevertheless, it is my opinion that the person skilled in the art would construe “symmetrically provided” as the end portions being substantially the same distance from, and either side of, the centre of rotation of each pawl, as well as the end portions being in the same plane with respect to the axis of the centre of rotation - as this is clearly shown in figures 2-4 of the Patent.
15. It is appropriate to consider the construction of “engaging end” and “a pair of opposing end portions” together. The requester has argued that from the description of the Patent, each pawl comprises one engagement end and one balancing end and that, during operation, the balancing end interacts with a ratchet tooth to restore position and the engaging end subsequently engages to prevent reverse rotation. The requester therefore argues that engagement is functionally singular per pawl at any given moment and is dependent on a defined engaging end.
16. The observer has discussed the construction of “a pair of opposing end portions” as meaning ‘opposing sides of the same end portions’ (as shown in the observer’s version of figure 3A with additional annotations shown below). The observer therefore considers that each pawl can be construed as comprising multiple balancing and engaging ends.

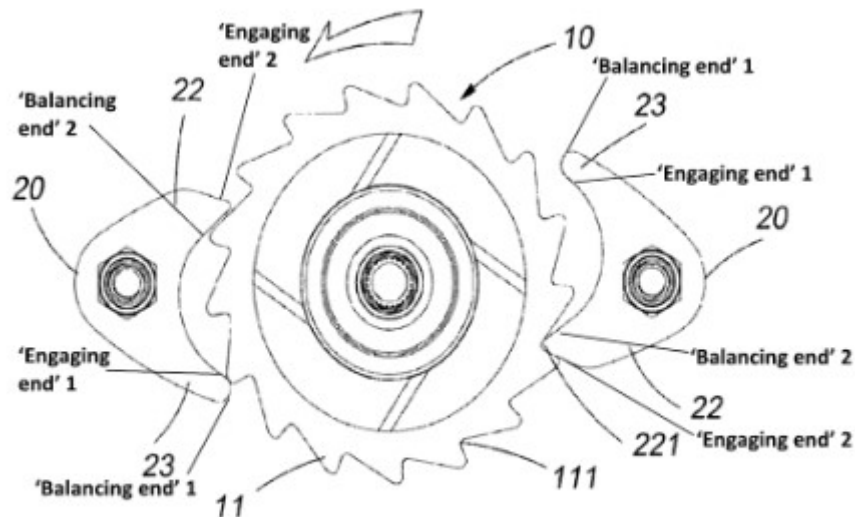


FIG.3B

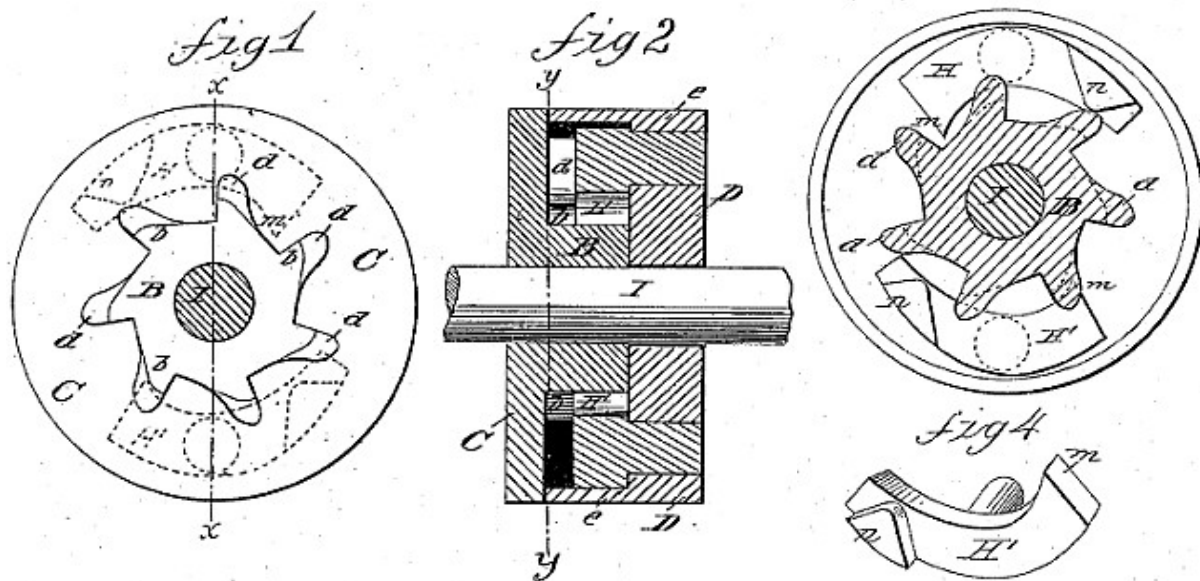
17.

18. However, I cannot see how the person skilled in the art would construe “a pair of opposing end portions” as meaning or encompassing “opposing sides of the same end portions”. Figures 2-4 clearly only show, and the description only discusses, each pawl having a *single* engaging end and a *single* balancing end as the pair of opposing end portions. I further note that it is not clear how the pair of opposing end portions construed in the form of “opposing sides of the same end portions” would be ‘symmetrically provided with respect to the centre of rotation’ and/or ‘diagonally opposite’. Claim 1, the description and the figures also only discuss the “engaging” of the end portion in the context of locking the teeth of the ratchet wheel. Thus the person skilled in the art would construe the “engaging” end as not simply touching the wheel, but it must be suitable for locking the teeth of the ratchet wheel. Thus, it is my opinion that the person skilled in art would construe “engaging end” and “a pair of opposing end portions” as each pawl *only* having a *single* engaging end for locking the teeth of the ratchet wheel and a *single* balancing end.

Validity

The Prior art

19. US 305,697 A relates to a pawl and ratchet mechanism. The mechanism has a disk C with integral wheel B, with the disk C having axial shaft I. The wheel has teeth b and cams d. The mechanism also has pawls H and H' which each have a detent m at one end and a cam block n at the other end.
20. In operation, during rotation of the disk C in its free direction, the pawls H H' will be ‘vibrated’ such that a ratchet-tooth lifts one end of a pawl H to clear it, with a cam coming into operation upon cam-block n to cause the end of a pawl which has just cleared a tooth to follow down near to the radial face of said tooth. Upon a reversal of disk C the cams d come into action to throw the free ends of the pawls H near to the radial face of the teeth and leave them there in the track of said teeth to be engaged, so as to stop all reverse motion. Using such means a pawl and ratchet is provided in which the pawl is automatically and positively vibrated independently of gravity or spring power. Figures 1-4 are reproduced below.



Novelty

21. In order for a claim to lack novelty, a prior art disclosure must clearly and unambiguously disclose all of the features of the claim. The requester has argued that US 305,697 has all of the features of claim 1. They note that US 305,697 demonstrates that opposed pawl ends performing engagement and stabilisation functions – in particular using geometry-driven engagement and restoration – were already known
22. In their letter, the observer accepts that US 305,697 has all of the features of claim 1 except the feature of “a pair of opposing end portions symmetrically provided with respect to the centre of rotation”. Specifically, the observer argues that, in US 305,697, the end portions are the detents m and cam-blocks n – with the cam-block n being an additional component fixed to side of pawl such that they do not operate in the same plane as the detents m and therefore are not symmetrical about the centre of rotation.
23. It is my opinion that US 305,697 does not disclose “a pair of opposing end portions symmetrically provided with respect to the centre of rotation” in claim 1 of the Patent as construed above. In particular, the end portions are the detents m and cam-blocks n – where the cam block n is at least not in the same plane with respect to the axis of the centre of rotation as the detent m, and so cannot be said to be ‘symmetrically provided’ as properly construed. Therefore, it is my opinion that claim 1 is novel in light of US 305,697.

Inventive Step

24. In their observations in reply, the requester has also argued that the claims lack an inventive step in light of US 305,697.
25. To determine whether or not an invention defined in a particular claim is inventive over the prior art, I will rely on the four step test established in *Pozzoli*³ which

³ *Pozzoli SPA v BDMO SA* [2007] EWCA Civ 588

reformulated the well-known *Windsurfing*⁴ test. The Pozzoli steps are as follows:

- (1)(a) Identify the notional “person skilled in the art”;
- (1)(b) Identify the relevant common general knowledge of that person;
- (2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;
- (3) Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or the claim as construed;
- (4) Viewed without any knowledge of the alleged invention as claimed, determine whether those differences constitute steps which would have been obvious to the person skilled in the art.

26. The person skilled in the art is a mechanical engineer specialising in the design of ratchet braking devices. He or she would have a knowledge of pawls and ratchet wheels and the materials and manufacturing processes utilised in making them.
27. The inventive concept of claim 1 lies in a ratchet wheel and a pair of pawls, in which the pawls are in constant contact with the ratchet wheel in the absence of torsion springs, where each pawl has a pair of opposing end portions symmetrically provided about the pawl’s centre of rotation with one end portion being an engagement end for locking teeth of the ratchet wheel and the other end portion being a balancing end, for restoring a position of the engaging end, and the engaging ends of the respective pawls being diagonally opposite.
28. As discussed above in the discussion of novelty, the difference between the inventive concept and US 305,697 (the ‘state of the art’) lies in “a pair of opposing end portions symmetrically provided with respect to the centre of rotation”.
29. The observer argues that in the mechanism of US 305,697 there are effectively two sets of ratchet teeth – cams d and teeth b – with the balancing n and engaging ends m interacting with these two different components (cams d and teeth b respectively). The observer argues that there are several advantages of the Patent over US 305,697. Firstly, manufacturing the ratchet wheels and pawls is more straightforward as it does not require joining separate components together or complex machining from a single piece of material. The components can be installed immediately as they are formed and do not require additional fixing means in order to fix the additional components (cams d and cam blocks n). Similarly, as it relies on the fixing together of separate components, the structure disclosed in US 305,697 suffers from the disadvantage of the components becoming loose or separated, potentially resulting in a non-functional braking system and requiring repairs. As the ratchet wheel and pawls of the Patent are single components, the advantage is provided that the frequency of the components breaking and requiring repair is reduced. Furthermore, as the balancing ends and engaging ends of the pawls of the Patent operate in the same plane, the braking structure can be installed and

⁴ *Windsurfing International Inc. v Tabur Marine (Great Britain) Ltd*, [1985] RPC 59

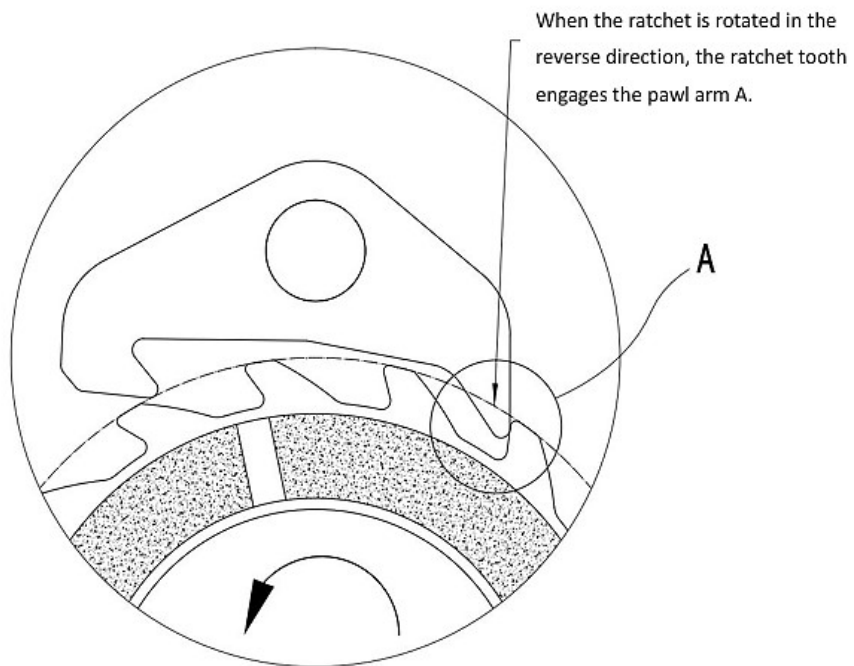
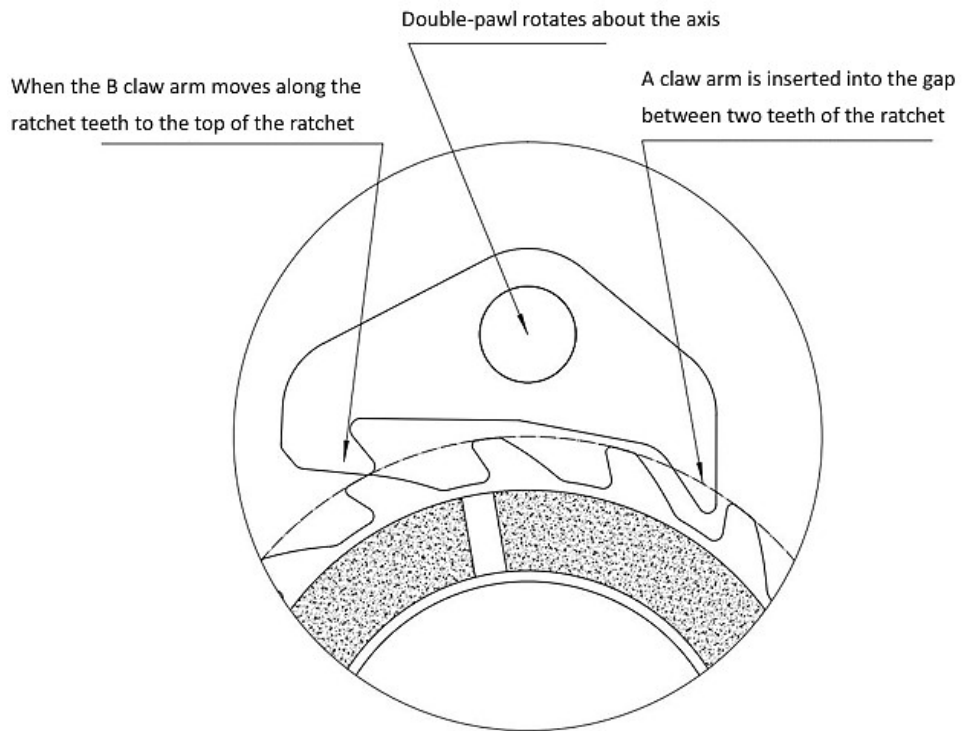
operated in narrower spaces, broadening its range of applications. The additional components required in US 305,697 increase the overall depth dimensions of the braking structure and therefore it could not fit into similarly narrow spaces

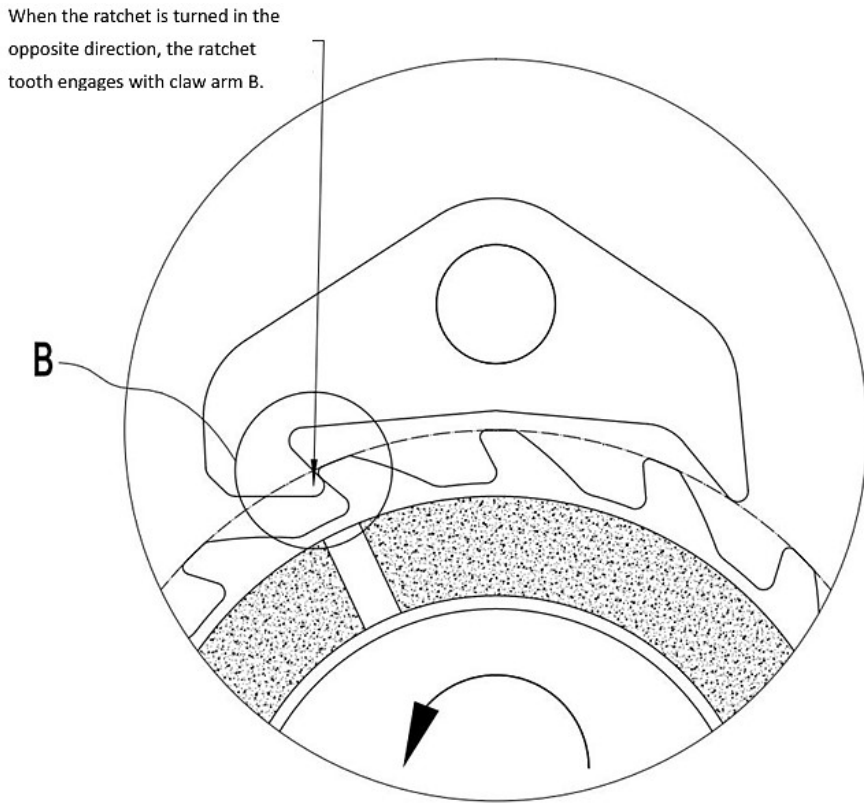
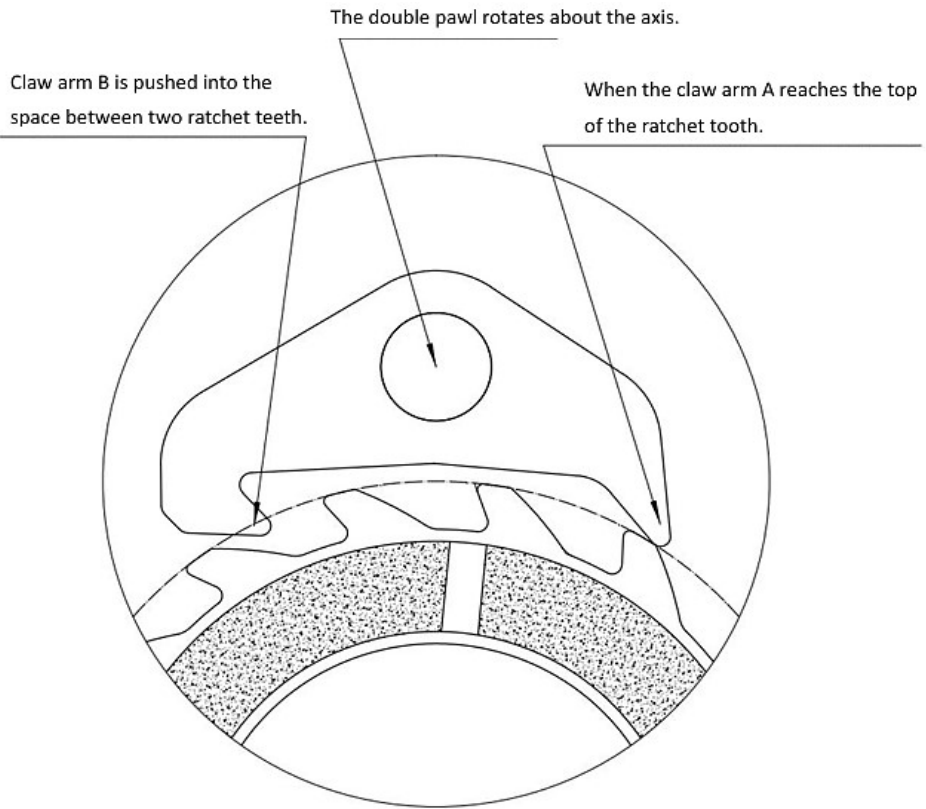
30. The requester is of the opinion that, while the structural implementation differs, the underlying functional principle (of the Patent) appears to be established in US 305,697. The requester further notes that the difference with US 305,697 appears to relate to the manner in which known functions are implemented, including simplification and integration of components, rather than to the introduction of a new functional principle, and that distinctions drawn between the use of multiple components in US 305,697 and an integrated or single-piece configuration in the Patent relate to implementation and manufacturing choices, rather than to a difference in underlying technical principle. In particular, the functional interactions described in US 305,697 A - namely the engagement and restoration of a pawl through interaction with ratchet features - do not depend on the components being separate or integrated.
31. Whilst the Patent may provide for the 'simplification and integration of components' compared to US 305,697, I am of the opinion that the person skilled in the art would not consider the provision of a 'single-piece configuration' – through the use of pawls with opposing engaging and balancing end portions in the same plane – to be simply down to 'implementation and/or manufacturing choices'. Whilst the functionality of the Patent and US 305,697 can be generalised to be broadly similar, their actual implementation is realised quite differently by the engagement and balancing being in the same plane. It is my opinion that having end portions 'symmetrically provided' requires significant adaption of US 305,697 to both the pawls and the wheel which is not pointed towards in US 305,697, nor would be arrived at by the person skilled in the art without hindsight. Therefore, in my opinion, claim 1 would not be obvious to the person skilled in the art in light of US 305,697 and their common general knowledge.

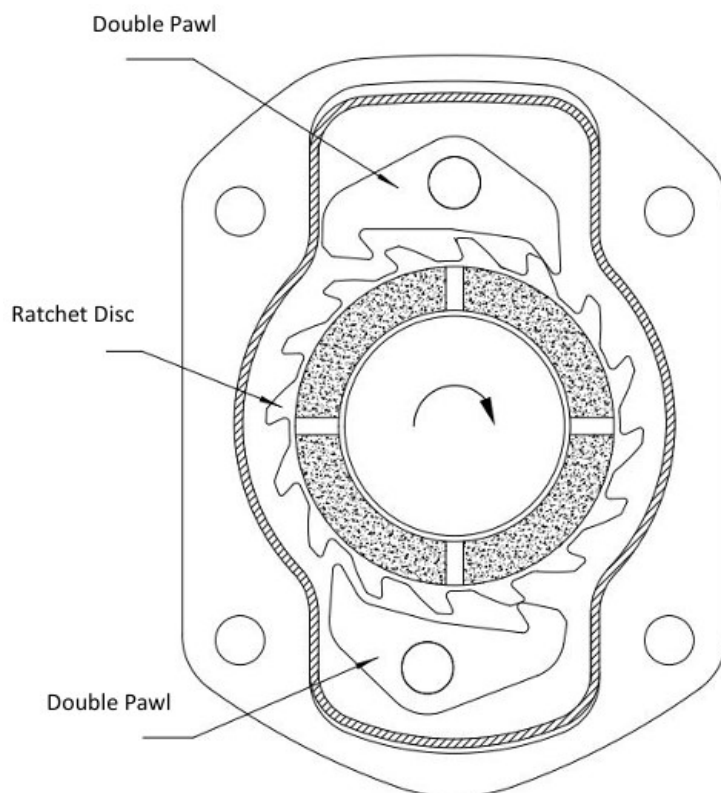
Infringement

The Design

32. The requester has asked for an opinion as to whether their design infringes claim 1 of the Patent. This design is said to incorporate a 'quad-engagement' backstop arrangement to create four discrete points of ratchet engagement, achieved using two single-piece 'double' pawls, with each pawl having arms 'A' and 'B' and an axis of rotation.
33. In operation, as shown in the figures provided by the requester (and reproduced below), when one pawl arm (A or B) is disengaged from the tooth, the other pawl arm is pushed to contact the tooth. Furthermore, during rotation (clockwise) of the toothed ratchet wheel, when claw arm B moves along the ratchet teeth, claw arm A is inserted into the gap between two teeth in the ratchet, and when claw arm A moves along the ratchet teeth, claw arm B is inserted into the gap between two teeth in the ratchet. When the ratchet is turned in the opposite direction (counter-clockwise) the ratchet tooth will engage with claw arm A or B. The requester has also discussed the angles of the ratchet teeth used to make such an arrangement work effectively.







34. Section 60 of the Act states that:

(1) Subject to the provisions of this section, a person infringes a patent for an invention if, but only if, while the patent is in force he does any of the following things in the United Kingdom in relation to the invention without the consent of the proprietor of the patent, that is to say-

(a) Where the invention is a product, he makes, disposes of, offers to dispose of, uses or imports the product or keeps it whether for disposal or otherwise;

(b) Where the invention is a process, he uses the process or he offers it for use in the United Kingdom when he knows, or it is obvious to a reasonable person in the circumstances, that its use there without the consent of the proprietor would be an infringement of the patent;

(c) Where the invention is a process, he disposes of, offers to dispose of, uses or imports any product obtained directly by means of that process or keeps any such product whether for disposal or otherwise.

(2) Subject to the following provisions of this section, a person (other than the proprietor of the patent) also infringes a patent for an invention if, while the patent is in force and without the consent of the proprietor, he supplies or offers to supply in the United Kingdom a person other than a licensee or other person entitled to work the invention with any of the means, relating to an essential element of the invention, for putting the invention into effect when he knows, or it is obvious to a reasonable person in the circumstances, that those means are suitable for putting, and are intended to put, the invention into effect in the United

Kingdom.

35. In the Supreme Court in *Actavis UK Limited*⁵ Lord Neuberger stated that the problem of infringement is best approached by addressing two issues, each of which is to be considered through the eyes of the notional addressee of the patent in suit, i.e. the person skilled in the relevant art. Those issues are:

(i) does the variant infringe any of the claims as a matter of normal interpretation; and, if not,

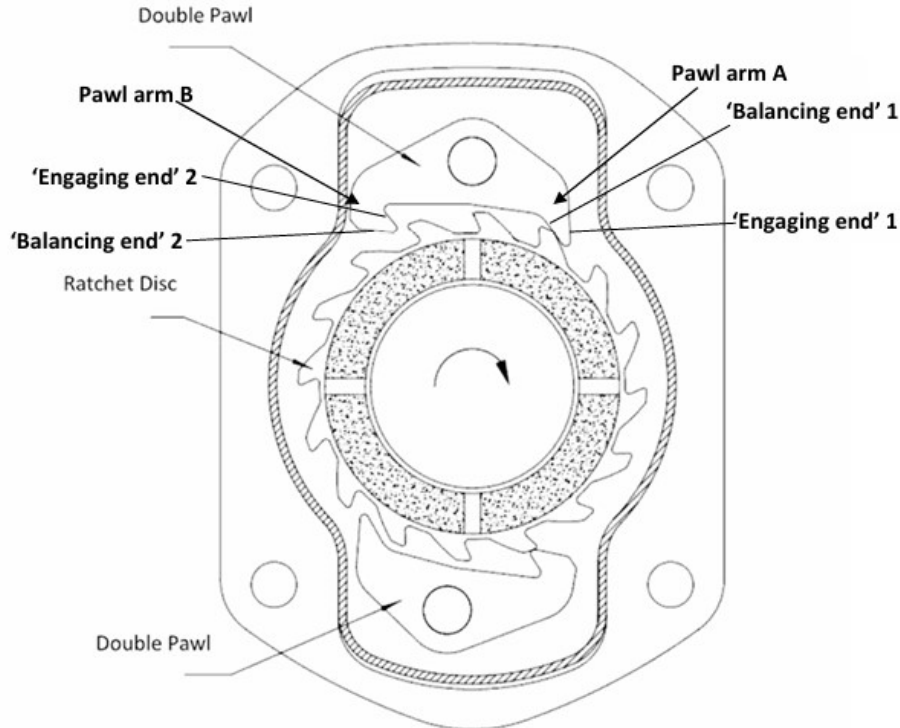
(ii) does the variant nonetheless infringe because it varies from the invention in a way or ways which is or are immaterial?

36. If the answer to either issue is “yes”, there is an infringement; otherwise, there is not.

Does the Design infringe as a matter of normal interpretation?

37. The observer has argued that the requester’s design contains all of the features of claim 1 of the Patent and that the design would infringe the Patent as properly construed. In particular, they argue that the pawls of the requester’s device comprise a pair of opposing end portions symmetrically provided with respect to the centre of rotation (pawl arms A and B), wherein one end portion is an engaging end for engaging with and locking the teeth of the ratchet wheel (pawl arm A) and the other end portion is a balancing end for restoring a position of the engaging end (pawl arm B). A pawl arm A of one pawl is diagonally opposite the pawl arm A of the other pawl.
38. The observer submits that each pawl arm of the design has two end portions in the form of both a balancing end and an engaging end. The observer has provided their own drawing of the design (reproduced below), in which pawl arm A is shown with balancing end 1 and engaging end 1 and pawl arm B is shown with balancing end 2 and engaging end 2. In practice, the observer submits, the paired balancing and engaging ends are opposing sides of the same pawl arm end.

⁵*Actavis UK Limited and others v Eli Lilly and Company* [2017] UKSC 48



39. The observer argues that this configuration does not depart from the scope of claim 1 as each pawl of the requester's device has (at least) a pair of opposing end portions (either engaging end 1 and balancing end 2, or engaging end 2 and balancing end 1). One of the end portions is an engaging end (engaging end 1 or engaging end 2) and the other end portion is a balancing portion (balancing end 1 or balancing end 2). Therefore, no matter which combination of balancing ends and engaging ends are considered, the features do not depart from the scope of claim 1.
40. The requester has argued that, in their design, each pawl incorporates multiple engaging and balancing regions arranged such that more than one region may contribute to load bearing engagement during backstop conditions. Engagement is therefore not limited to a single defined "engaging end" per pawl but is distributed across multiple regions within the same pawl body.
41. It is my opinion that the design has a pair of pawls, each with a centre of rotation and a pair of opposing end portions (arms A and B) symmetrically provided. However, in my opinion the design does not infringe as a matter of normal interpretation of claim 1. In particular, the design does not have only one opposed end of the pawl for engaging with the teeth of the wheel ratchet with the other opposed end for balancing as required by claim 1 of the Patent as properly construed – it has two opposing ends for engaging with the locking teeth of the wheel (and two respective opposing ends for balancing).

Does the Design infringe in a way(s) which is immaterial?

42. The observer has argued that the addition of a further balancing end and engaging end to each pawl arm is immaterial to the question of infringement as each pawl still includes a balancing end and an engaging end.

43. The court in *Actavis UK Limited* provided a reformulation of the three questions in *Improver*⁶ to provide guidelines or helpful assistance in connection with this second issue. These reformulated questions are:
- (i) Notwithstanding that it is not within the literal meaning of the relevant claim(s) of the patent, does the variant achieve substantially the same result in substantially the same way as the invention, i.e. the inventive concept revealed by the patent?
 - (ii) Would it be obvious to the person skilled in the art, reading the patent at the priority date, but knowing that the variant achieves substantially the same result as the invention, that it does so in substantially the same way as the invention?
 - (iii) Would such a reader of the patent have concluded that the patentee nonetheless intended that strict compliance with the literal meaning of the relevant claim(s) of the patent was an essential requirement of the invention?
44. In order to establish infringement in a case where there is no literal infringement, a patentee would have to establish that the answer to the first two questions was “yes” and that the answer to the third question was “no”.
45. In my opinion that the design does not “achieve substantially the same result in substantially the same way as the invention”. The inventive concept (see paragraph 27 above) is about the individual and singular functionality of respective opposing ends of the pawls to engage and balance. In contrast, the use of opposing pawl ends having multiple functions (i.e. both engagement and balance) does not achieve substantially the “same result” in at least that the design provides more load security and/or redundancy by having additional (i.e. four rather than two) engagement points with the teeth of the wheel. Therefore, it is my opinion that the design cannot be said to vary in a way that is immaterial.

Opinion

46. It is my opinion that the Patent is novel and inventive in light of US 305,697. It is also my opinion that the design does not fall within the scope of claim 1 as a matter of normal interpretation, nor does it vary from the Patent in a way that is immaterial.

Application for review

47. Under section 74B and rule 98, the proprietor may, within three months of the date of issue of this opinion, apply to the comptroller for a review of the opinion.

Ben Widdows
Examiner

⁶ *Improver* [1990] FSR 181

NOTE

This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.