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**ASM Technology Singapore Pte Ltd**

**v**

**Towa Corporation**

**[2018] SGCA 01**

Court of Appeal — Civil Appeal No 9 of 2017  
Sundares Menon CJ, Andrew Phang Boon Leong JA and Tay Yong  
Kwang JA  
16 August 2017

Intellectual Property — Patents — Infringement

5 January 2018

Judgment reserved.

**Tay Yong Kwang JA (delivering the judgment of the court):**

1 The Respondent was granted a patent (the “Patent”) by the Singapore Registry of Patents in 1999. The Respondent commenced infringement proceedings against the Appellant in the High Court and succeeded in its claim. This is the appeal against the High Court’s decision allowing the Respondent’s claim against the Appellant (which was the first defendant in the High Court) for infringement of the Patent and dismissing the Appellant’s counterclaim against the Respondent for making groundless threats of infringement. The Respondent’s claim against the Appellant’s parent company (the second defendant at the trial) was dismissed and that defendant is not involved in the appeal before us. The judgment (the “Judgment”) of the High Court Judge (the “Judge”) is reported at *Towa Corp v ASM Technology Singapore Pte Ltd and another* [2017] 3 SLR 771.

2 The trial was a bifurcated one. The Judgment and this appeal relate to the issue of liability only.

### **Background**

3 The Respondent was the registered proprietor of the Patent entitled “Method of and Apparatus for Moulding Resin to Seal Electronic Parts”. The Patent’s earliest priority date (based on the original patents in Japan) was 22 July 1993. The filing date in Singapore was 6 July 1994. The date of grant in Singapore was 22 February 1999.<sup>1</sup> The Judge stated that the Patent “expired sometime in 2014, although parties seem to differ on the exact date of expiry” (Judgment at [1]). A search in the Intellectual Property Office of Singapore’s website shows the expiry date of the Patent as 6 July 2014.

4 The infringing acts concerned a product known as the “IDEALmold” machine, which the Appellant manufactured, sold, offered for sale and kept in Singapore. Sometime in 1999, the Appellant began manufacturing and selling the IDEALmold machines which were found by the Judge to have infringed the Patent. The Patent concerns moulding technology and moulding machines/apparatus. As explained by the Judge, the moulding process encapsulates the electronic circuitry with a layer of thermo-setting plastics (also known as “resin”). A moulding apparatus softens resin with heat and then injects the softened resin into a mould under high pressure. The end result is a layer of resin encasing and sealing the electronic circuitry, protecting it from heat and environmental hazards. The word “mould” was spelt as “mold” in various documents tendered at the trial but we shall use only the spelling “mould” unless we are quoting from the documents.

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<sup>1</sup> RSCB54 (Certificate of Grant of Patent).

5 By way of describing the background art, the Patent describes the components of the then-conventional moulding apparatus:<sup>2</sup>

Description of the Background Art

In general, electronic parts are sealed with molded resin by transfer molding, through a resin molding/sealing apparatus having the following basic structure:

Such a resin molding/sealing apparatus comprises a mold having fixed and movable *mold sections* which are opposed to each other, *resin material supply pots* which are arranged in the mold, *plungers* which are mounted on the pots for pressurizing resin, *cavities* which are provided in mold surfaces of the fixed and movable mould sections respectively to face each other, and *resin passages* provided between the pots and the cavities.

Resin tablets are supplied in the pots while electronic parts which are mounted on lead frames are supplied and set in prescribed positions of the cavities, and the mold is closed. The resin tablets provided in the pots are heated and pressurized- so that the resin materials melted in the pots are injected and charged into the cavities provided on side positions of the pots through the resin passages respectively. Thus, the resin is molded to seal the electronic parts engaged in the cavities respectively.

[Emphasis added]

6 The Patent also describes the then-conventional moulding sequence:<sup>3</sup>

In a conventional method of molding resin to seal electronic parts ... an unsealed lead frame supplying step of supplying unsealed lead frames into prescribed positions of cavities provided in a mold, a resin tablet supplying step of supplying resin tablets into pots provided in the mold, a sealed lead frame takeout step of taking out the sealed lead frames from the mold to the exterior, and a mold surface cleaning step of cleaning mold surfaces of the mold after resin molding/sealing are generally successively carried out independently of each other.

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<sup>2</sup> RSCB4 (Patent)

<sup>3</sup> RSCB7 (Patent)

In such a conventional method of molding resin to seal electronic parts, therefore, the overall molding time is so increased that productivity is extremely reduced.

***Invention***

7 The Patent summarises the invention claimed therein as a “*method* of and an *apparatus* for molding resin to seal electronic parts, which can simply cope with production of electronic parts to be sealed with molded resin in small and large quantities” [emphasis added].<sup>4</sup> These, in turn, comprise a moulding apparatus equipped with a single moulding unit, *in relation to which* any number of additional moulding units can be detachably mounted. This allows the moulding apparatus to be “responsive to mass production without increasing the mold itself in size”, simply by “adjust[ing] the number of the molding units provided on the molding apparatus in response to the production capacity as required” (see excerpt at [47] below).<sup>5</sup>

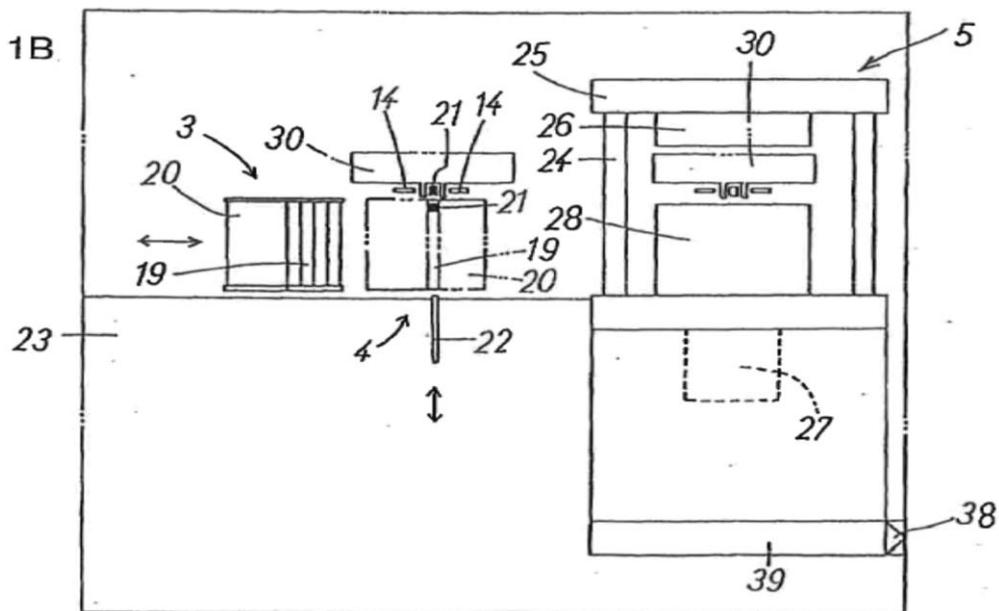
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<sup>4</sup> RSCB8 (Patent)

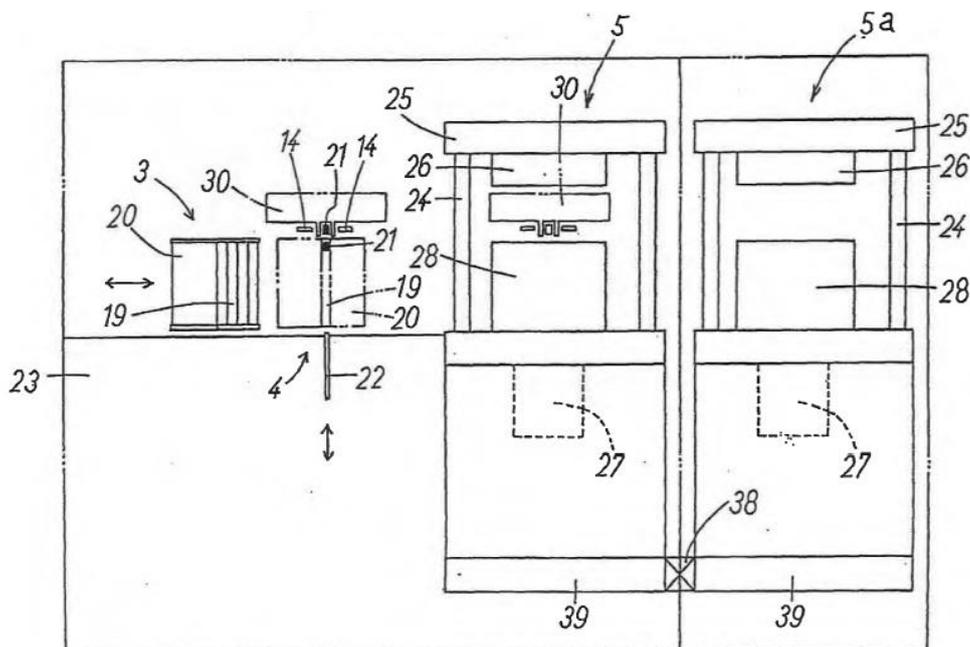
<sup>5</sup> RSCB9–10 (Patent)

8 Figures 1B and 3 in the Patent depict the side views of the invention claimed:

**Figure 1B**

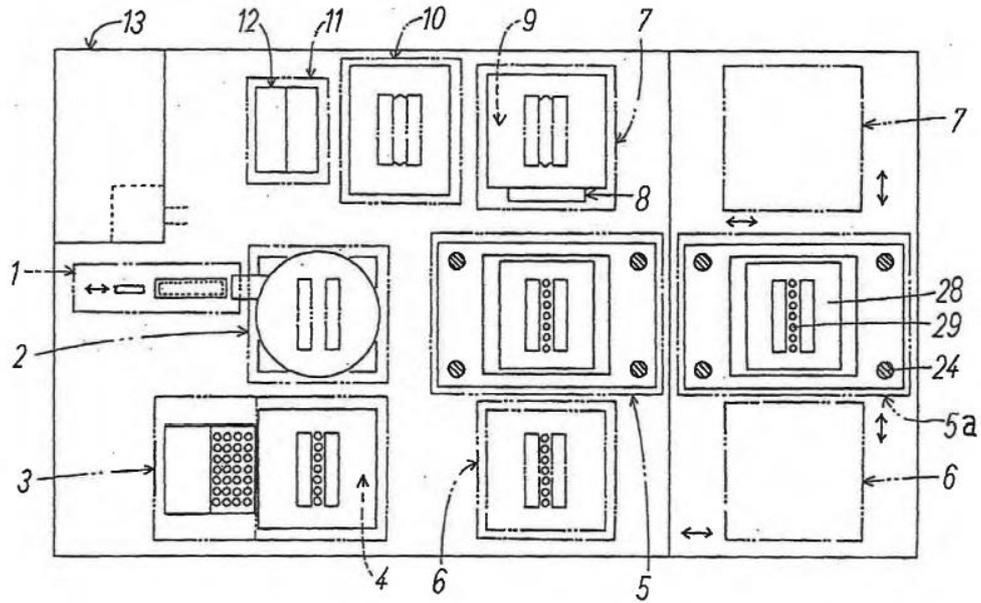


**Figure 3**

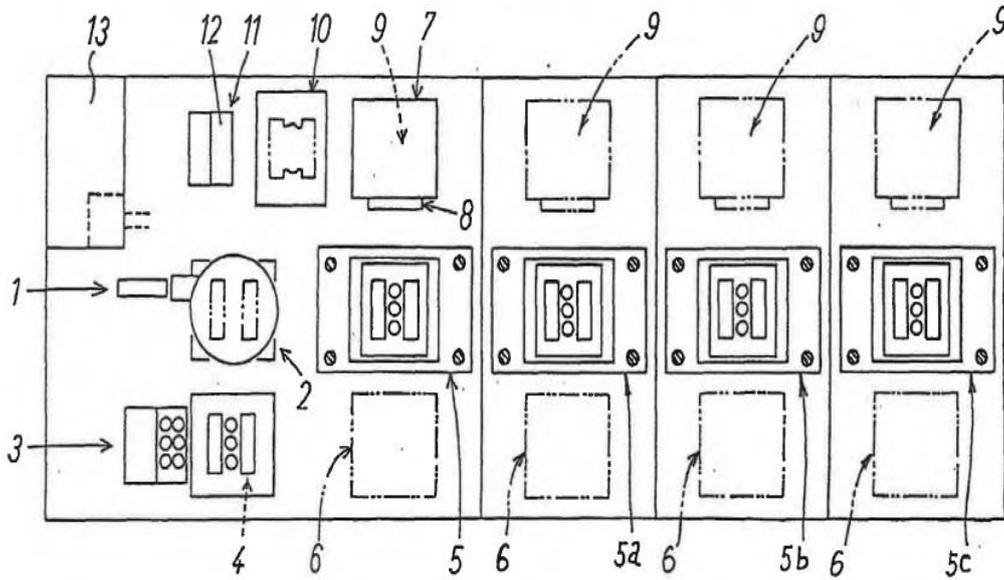


9 Figures 2 and 4 of the Patent are overhead diagrammatic representations of the invention claimed:

**Figure 2**



**Figure 4**



10 Four claims are in dispute between the parties. The numbers in parentheses in the following sub-paragraphs correspond to the parts denoted by the numbers in Figure 3 and/or Figure 4.

(a) Claim 1 is a process claim involving a method of moulding resin to seal electronic parts through a moulding unit (5), to which additional moulding units (5a, 5b, 5c) can be detachably mounted to adjust the total number of moulding units on the moulding apparatus.<sup>6</sup>

1. A method of molding resin to seal electronic parts for sealing electronic parts being mounted on lead frames with a resin material through a molding unit (5) having a mold (26, 28), resin supply pots (29) being arranged in said mold, resin pressurizing plungers being provided on said pots, cavities being provided in mold surfaces of said mold, and resin passages being provided between said cavities and said pots, said method comprising:

a step of adjusting the number of molding units by detachably mounting an additional molding unit (5a, 5b, 5c) with respect to said molding unit (5) being already provided in an apparatus for molding resin to seal electronic parts;

a step of supplying unsealed lead frames (14) having electronic parts mounted thereon and resin tablets (21) into each said molding unit (5, 5a, 5b, 5c);

a step of molding resin to seal said electronic parts through each said molding unit (5, 5a, 5b, 5c); and

a step of taking out sealed said electronic parts from each said molding unit (5, 5a, 5b, 5c) to the exterior.

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<sup>6</sup> RSCB46 (Patent)

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(b) Claim 2 is a process claim involving a process of supplying lead frames through the resin-moulding process described in Claim 1.<sup>7</sup>

2. A method of molding resin to seal electronic parts in accordance with Claim 1, wherein said step of supplying said unsealed lead frames (14) having electronic parts mounted thereon and said resin tablets (21) into each said molding unit (5, 5a, 5b, 5c) includes:

... transferring said unsealed lead frames (14) being set in said lead frame aligning unit (2) and said resin tablets (21) being aligned with each other in said resin tablet discharge unit (4) into a clearance between a fixed mold section (26) and a movable mold section (28) in each said molding unit (5, 5a, 5b, 5c) while supplying said unsealed lead frames (14) into prescribed positions of said cavities in each said molding unit (5, 5a, 5b, 5c) and supplying resin tablets (2) into said pots,

... closing said fixed mold section (26) and said movable mold section (28) while heating, pressurizing and melting said resin tablets (21) in said pots for injecting and charging molten resin materials into said cavities through said resin passages thereby molding resin to seal said electronic parts being engaged in said cavities, and

... taking out said sealed electronic parts from each said molding unit (5, 5a, 5b, 5c) to the exterior.

(c) Claim 4 is a product claim involving an apparatus comprising a moulding unit (5), to which additional moulding units (5a, 5b, 5c) can be detachably mounted to freely increase/decrease the total number of moulding units of the apparatus.<sup>8</sup>

4. An apparatus for molding resin to seal electronic parts, comprising:

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<sup>7</sup> RSCB47 (Patent)

<sup>8</sup> RSCB49–50 (Patent)

a molding unit having a mold (26, 28), resin material supply pots being arranged in said mold, resin pressurizing plungers being provided on said pots, cavities being provided in mold surfaces of said mold, and resin passages being arranged between said pots and said cavities;

means for supplying unsealed lead frames (14) having electronic parts mounted thereon and resin tablets (21) into said molding unit (5); and

means for taking out sealed said electronic parts from said molding unit (5) to the exterior,

additional molding units (5a, 5b, 5c) being rendered detachably mountable with respect to already provided said molding unit (5), thereby freely increasing/decreasing the number of said molding units.

(d) Claim 5 is a product claim involving an apparatus for supplying unsealed lead frames (14) having electronic parts mounted thereon and resin tablets (21) through the resin-moulding product described in Claim 4, which comprises multiple moulding units (5, 5a, 5b, 5c).<sup>9</sup>

5. An apparatus for molding resin to seal electronic parts in accordance with Claim 4, wherein said means for supplying said unsealed lead frames (14) having electronic parts mounted thereon and said resin tablets (21) into each said molding unit (5, 5a, 5b, 5c) includes:

a supply unit (1) for supplying a number of unsealed lead frames (14) having electronic parts mounted thereon,

... a loader unit (6) for transferring aligned said lead frames (14) and said resin tablets (21) to each said molding unit (5, 5a, 5b, 5c), and

... means for taking out said sealed electronic parts from each said molding unit (5, 5a, 5b, 5c) to the exterior ...

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<sup>9</sup> RSCB50–51 (Patent)

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11 The abstract of the Patent thus describes the “method of an apparatus for moulding resin to seal electronic parts” disclosed therein as follows:<sup>10</sup>

A method of and an apparatus for molding resin to seal electronic parts are adapted to seal electronic parts which are mounted on lead frames (14) with molded resin materials through molding units (5, 5a, 5b, 5c).

Additional molding units (5a, 5b, 5c) are detachably mounted with respect to an already provided molding unit (5) so that the number of the molding units can be arbitrarily adjusted, thereby enabling arrangement in a resin molding/sealing step, to implement simple response to mass-production.

***Parties’ positions***

12 The Respondent claimed that the Appellant infringed Claims 1, 2, 4, and 5 of the Patent by performing the following acts in Singapore without its consent (Judgment at [9]):

- (a) Offering for use, in Singapore, the IDEALmold machine: this infringed Claims 1 and 2 of the Patent.
- (b) Making, keeping, offering to dispose and disposing of, in Singapore, the IDEALmold machine: this infringed Claims 4 and 5 of the Patent.

13 The Appellant opposed the Respondent’s claims on six grounds (Judgment at [11]):

- (a) The Patent was invalid for lack of novelty, inventive step, and sufficiency.

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<sup>10</sup> RSCB53 (Patent)

- (b) The IDEALmold machine merely embodied the teaching of an apparatus previously disclosed in the prior art available before the Priority Date without substantial or patentable variation.
- (c) The Patent’s claims did not cover the IDEALmold machine.
- (d) The method covered by Claims 1 and 2 of the Patent was neither used nor offered for use with respect to the IDEALmold machine in Singapore.
- (e) It did not have knowledge and a reasonable person would not find it obvious in the circumstances, that the making, keeping, offering for use, offering to dispose or disposal of the IDEALmold machine in Singapore constituted use of the process in Claims 1 or 2 of the Patent.
- (f) The claim of infringement was precluded by the defences of limitation, estoppel, delay, laches, and/or acquiescence.

14 The Appellant counterclaimed against the Respondent for making groundless threats of infringement proceedings.

**Decision below**

15 The Judge found that Claim 2 was dependent on Claim 1 and that Claim 5 was dependent on Claim 4. Because Claim 1 was similar to Claim 4 in that Claim 1 taught the process whereby the moulding apparatus in Claim 4 was operated, the focus of the inquiry was Claim 4 (Judgment at [14]–[15]).

***Interpretation of Claims in Patent***

16 The Judge accepted the interpretation of Claim 4 put forward by the Respondent. The Appellant’s expert, Dr Michael Pecht (“Dr Pecht”), also

agreed substantially with the essential elements in the definition (Judgment at [22]).

... the application of the concept of modularity to the molding units of molding machines. The Patent teaches how this modularity can be achieved by having molding machines with molding units which are ‘detachably mountable’ (i.e. detachable and attachable) to each other, so as to enable a customer who has bought such a molding machine, the flexibility of subsequently increasing or decreasing the number of molding units according to desired production capacity.

17 The Judge held as follows in relation to the other interpretational differences between the parties in respect of various terms in the Patent (Judgment at [23]–[36]):

(a) “Molding unit” referred to the entire structure denoted by each of (5) and (5a), which structure included a mould switching mechanism (27) and a bottom base (39).

(b) “Freely increasing/decreasing” referred to the capability to increase and decrease the number of moulding unit(s) in relation to a moulding apparatus. This included apparatuses that required complex and time-consuming attachment/detachment and positioning operations to be performed when increasing or decreasing the number of moulding units.

(c) “Additional moulding units” in relation to a moulding apparatus included even a single moulding unit that had been rendered detachably mountable. The invention in Claim 4 concerned the application of the concept of modularity to the moulding units of moulding apparatus. The actual number of moulding units involved was irrelevant. The whole point was that this number was supposed to be flexible. However, such additional moulding units had to be added after (and not during) the

manufacture of the moulding apparatus. The object of the invention in the Patent was a moulding apparatus that could respond to changes in production needs by increasing and decreasing the number of moulding units. This was a feature that could exist only in a moulding apparatus that had already been built.

### ***Validity of Patent***

18 The Judge found that the Patent was valid because it fulfilled the requirements of novelty, inventive step and sufficiency.

19 First, the invention in the Patent – the *modularity of moulding units* – was novel because it was not anticipated by the three pieces of prior art: “NEC”, “Hitachi” and “ASA 808K”. NEC and ASA 808K involved moulding apparatuses with table-tops or base plates of *fixed dimensions*, which left no space for the post-manufacture addition of moulding units (Judgment at [46]–[48] and [55]–[59]). Hitachi contemplated exchangeability or modularity of only the moulds (for maintenance or design variation) and not of the moulding units (for adjustment of production capacity) of the moulding apparatus (Judgment at [49]–[54]).

20 Second, the invention in Claim 4 involved an inventive step. The Appellant made no meaningful attempt to compare the invention in Claim 4 with the prior art and to show how and why the differences (if any) were obvious to a person skilled in such art. Moreover, the Appellant did not even appear to have adopted in its closing submissions Dr Pecht’s opinion that the invention in Claim 4 had been anticipated by the three pieces of prior art. Accordingly, the Appellant failed to discharge its burden of proving that no inventive step was involved (Judgment at [63]–[64]).

21 Third, the Patent satisfied the sufficiency requirement despite the absence of express literary description therein of the means for connecting moulding units. The burden of proving insufficiency lay with the Appellant, which was the party challenging the validity of a registered patent. Mr Haruo Tabata (“Mr Tabata”), the expert for the Respondent, gave evidence that the means for aligning and connecting the moulding units, which means were described in the Patent as “simple”, would have been obvious to a person skilled in the art. Dr Pecht provided no reasons or evidence for his bare assertion to the contrary. Consequently, the evidence of the Respondent remained unrebutted (Judgment at [68]–[75]).

### ***Infringement of Patent***

22 The Judge found that the IDEALmold machine fell squarely within the Patent claims. The IDEALmold machine envisaged modularity of moulding units which was achieved through a process labelled “retrofitting” that the Appellant offered as a service to its customers (Judgment at [77]).

23 The Judge did not accept the Appellant’s argument that evidence of retrofitting could not be given because retrofitting had not been pleaded by the Respondent. Retrofitting was simply a means to achieve modularity of the moulding units of the IDEALmold machine. It was not the alleged infringement. Nor could it be the alleged infringement because the Patent did not concern the *means* by which modularity was achieved. Rather, the alleged infringement lay in the fact that IDEALmold machine possessed the feature of modularity. It was thus sufficient that the Respondent had pleaded that the IDEALmold machine infringed the Patent (Judgment at [79]–[81]).

24 The Judge also did not accept that retrofitting was complex, costly and time-consuming and thus fell outside the Patent which provided for “freely increasing/decreasing” the number of moulding units. The Patent’s claims covered apparatuses with the feature of modularity and it was irrelevant that the means to achieve the modularity were complex, costly and time-consuming. In any event, retrofitting was not as complex, costly and time-consuming as the Appellant make it out to be (Judgment at [83]–[90]).

25 The Judge rejected the argument of the Appellant that the IDEALmold machine did not have a double-storage step purportedly disclosed in Claim 2, in that Claim 2 provided for the sealed lead frames containing sealed electronic parts to be transferred first to lead frame storage unit (12) and then to stock magazines (37). The transfer of sealed lead frames to lead frame storage unit (12) involved only the movement of the sealed lead frames and not the storage of the same (Judgment at [91]–[94]).

26 The Judge found accordingly that the IDEALmold machine, by virtue of its retrofitting feature, fell within Claim 4 (and Claim 5 which was dependent on Claim 4). Because Claim 1 simply taught the process whereby the moulding apparatus taught in Claim 4 was operated, the IDEALmold machine, to the extent of its operation, also fell within Claim 1 (and Claim 2 which was dependent on Claim 1) (Judgment at [90] and [95]).

27 The Judge found that the Appellant had infringed Claims 4 and 5 by making, disposing of, offering to dispose of and keeping the IDEALmold machine in Singapore. The Judge found further that the Appellant had infringed Claims 1 and 2 by selling and offering for sale the IDEALmold machine (which incorporated the infringing process, *ie*, the operation of the IDEALmold machine) for use in Singapore. Selling and offering for sale a product

incorporating an infringing process amounted to offering the infringing process for use. Further, in the circumstances, the Appellant must have known or it would have been obvious to a reasonable person, that the use of the IDEALmold machine in Singapore would have been infringing (Judgment at [98]–[109]).

### *Defences*

28 At the trial, the Respondent accepted that s 6 of the Limitation Act (Cap 163, 1996 Rev Ed) applied and that it was “only entitled to go back six years” (Judgment at [138]). Any damages awarded would therefore run from not more than six years before the Respondent filed its writ of summons on 19 April 2013.

29 On the remaining defences raised, the Judge held that the Appellant was relying essentially on only laches and acquiescence. He rejected, however, the Appellant’s reliance on the equitable defence of laches. The reliefs sought by the Appellant were statutory reliefs provided for by s 67(1) of the Patents Act (Cap 221, 2005 Rev Ed). There was thus no legal basis for the reliance on the equitable defence of laches. In any event, there was no delay on the part of the Respondent from the time that it became aware that the IDEALmold machine infringed the Patent. Even if there had been such a delay, there was no evidence to show that the Appellant suffered prejudice or injustice as a result of the delay (Judgment at [143]–[150]).

30 The Judge rejected also the Appellant’s reliance on the defence of acquiescence. The Respondent became aware that the IDEALmold machine infringed the Patent only in July 2011 and thereafter took steps to engage the Appellant (Judgment at [149]).

31 The Judge found that the Appellant could not avoid its liability for infringement of the Patent on the grounds of (a) being unaware of the existence

of the Patent under s 69(1) of the Patents Act; (b) relief for the infringement of partially valid patents under s 70 of the Patents Act and (c) “other bad behaviour” by the Respondent (at [150]–[156]).

### **Analysis**

32 Based on the findings of the Judge which the Appellant takes issue with, there are five main questions to be determined in this appeal:<sup>11</sup>

- (a) whether the concept of “modularity” fell within the scope of the monopoly claimed in the Patent;
- (b) whether the invention in the Patent was novel;
- (c) whether the Patent involved an inventive step;
- (d) whether the IDEALmold machine infringed the Patent; and
- (e) whether the threats of infringement made by the Respondent were groundless within the meaning of s 77 of the Patents Act.

33 We see no reason to disagree with the exposition of the law on these issues in the Judgment and have adopted and summarised it with only minor supplementation in the analysis to come.

### ***Interpretation***

34 The process of interpreting a patent is specified in s 113(1) of the Patents Act, which reads:

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<sup>11</sup> AC [6]–[9]

**Extent of invention**

**113.**—(1) For the purposes of this Act, an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.

35 In construing a patent specification, the claims themselves are the principal determinants. The description and other parts of the specification may assist in the construction but cannot be used to alter the plain meaning of the claims (*First Currency Choice Pte Ltd v Main-Line Corporate Holdings Ltd* [2008] 1 SLR(R) 335 at [23]–[24]). Subject to this, a patent specification “should be given a purposive construction rather than a purely literal one derived from applying to it the kind of meticulous verbal analysis in which lawyers are too often tempted by their training to indulge” (*Bean Innovations Pte Ltd v Flexon (Pte) Ltd* [2001] 2 SLR(R) 116 (“*Bean Innovations*”) at [62] citing *Catnic Components Limited v Hill & Smith Limited* [1982] RPC 183 at 243). Such an approach “balances the rights of the patentee and those of third parties” by “combin[ing] a fair protection for the patentee with a reasonable degree of certainty for third parties” (*FE Global Electronics Pte Ltd and others v Trek Technology (Singapore) Pte Ltd and another appeal* [2006] 1 SLR(R) 874 (“*FE Global*”) at [14]).

36 The Appellant contended in its written submissions that the Judge erred in his interpretation of the Patent in three ways:

- (a) the Judge had no basis to adopt “modularity” as the inventive concept of the Patent;

- (b) the Judge interpreted the Patent inconsistently in examining its validity and its infringement; and
- (c) the Judge should not have accepted the evidence of Mr Tabata.

37 The Appellant added in its oral submissions that the Patent spoke of a moulding apparatus containing a *finite* number of four moulding units for two related reasons.<sup>12</sup> First, the Patent refers expressly only to four moulding units: (5), (5a), (5b) and (5c). Second, the Patent contemplated the attachment of a maximum of three additional moulding units (5a, 5b, 5c) to a moulding apparatus which would comprise an existing moulding unit (5).

*Modularity as inventive concept of Patent*

38 The Appellant submitted that the Judge erred in adopting “modularity” as the inventive concept of the Patent because the term had simply been drawn from the Respondent’s closing submissions below. The term “modularity” did not even feature in the Patent.<sup>13</sup> Moreover, such a concept was contrary to the plain meaning and outside the language of the Patent’s claims. The concept appeared to have been imported as a “gloss” from the Description of the Patent<sup>14</sup> or as an “abstract[ion] [of] the respective different [C]laims into a general inventive concept with totally new language”.<sup>15</sup> We set out the relevant portion of the Appellant’s written submissions in this appeal:<sup>16</sup>

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<sup>12</sup> A’s Oral Subs 16/8/17

<sup>13</sup> A’s Oral Subs 16/8/17

<sup>14</sup> AC [17]

<sup>15</sup> AC [97]

<sup>16</sup> A’s Subs at [6(xiv)] and [6(xv)]

It was not disputed that save for the features “a step of adjusting the number of molding units by detachably mounting an additional molding unit with respect to said molding unit being already provided in an apparatus for molding resin to seal electronic parts” in Claim 1 and “additional molding units being rendered detachably mountable with respect to already provided said molding unit, thereby freely increasing/decreasing the number of said molding units” in Claim 4 respectively, all the other features of Claims 1, 2, 4 and 5 were common general knowledge or anticipated by the prior art. Note that the essential components making up a “molding unit” are also set out in the respective Claims 1 and 4 to aid interpretation

As the monopoly in Claim 1 therefore relates to a process comprising the “step of detachably mounting an additional molding unit” and the monopoly in Claim 4 is therefore an apparatus having “additional molding units being rendered detachably mountable” and “thereby freely increasing/decreasing the number of said molding units”, the Learned Judge had no reason to conclude that the “concept of modularity” was part of the Patent’s monopoly.

[Emphases removed]

39 We are unable to accept these submissions. In the Experts’ Joint Statement, which was prepared by Dr Pecht, both Dr Pecht and Mr Tabata agreed that the inventive concept of the Patent lay in the *detachable mounting* of additional moulding units with respect to a moulding unit already provided in a moulding apparatus.<sup>17</sup> At trial, Dr Pecht agreed further that the Respondent’s position was that “modular” or “detachably mountable” moulding units comprised the essence of the Patent.<sup>18</sup> Shortly thereafter, counsel for the Appellant did not take issue with an observation by the Judge that “modular” or “detachably mountable” moulding units comprised the basic concept of the Patent’s claim.<sup>19</sup> Despite the absence of the term “modular” or its derivations in

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<sup>17</sup> 2ACB7 (Expert Joint Statement)

<sup>18</sup> 3ROP868 (NE)

<sup>19</sup> 3ROP869 (NE)

the Patent, the concept of “modularity” was not contrary to the language of the Patent. Rather, it was used simply as a succinct, convenient and accurate shorthand for the substance of the invention therein.

(a) First, the Patent’s claims, particularly Claims 1 and 4, refer specifically to the rendering of “additional” moulding units “detachabl[e]” and “mountable”.

(b) Second, the Patent’s claims and drawings (at [8]–[9] above) describe and depict each detachable/mountable additional moulding unit (5a, 5b, 5c) as a “similar”<sup>20</sup> attachment to an existing moulding unit (5) of a moulding apparatus. This is evident from an overhead representation of the moulding apparatus.

(c) Third, the Patent’s claims describe how the detachable/mountable additional moulding units allow the number of moulding units of a moulding apparatus to be increased or decreased.

(d) Finally, the Patent’s specifications describe how the invention provides customers with the flexibility of subsequently changing the number of moulding units of a moulding apparatus to meet changing business needs.<sup>21</sup>

40 Dr Pecht in giving evidence that the prior art had anticipated the invention in the Patent sought to show that NEC and Hitachi concerned modularity. He testified that in NEC, one set of robotics controlled all the

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<sup>20</sup> 2ACB7 (Expert Joint Statement)

<sup>21</sup> RSCB8, 33 (Patent)

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moulding units on a moulding apparatus at any time, including moulding units that were added or removed after the manufacture of the moulding apparatus.<sup>22</sup> He added that in Hitachi, the “molds can be exchanged at one’s discretion”.<sup>23</sup>

41 Accordingly, we do not accept the Appellant’s suggestion that the Judge had no basis to find modularity as the inventive concept in the Patent.

*Limited vs. unlimited modularity*

42 The Appellant submitted further that the “confines of the Patent” were a moulding apparatus with no more than four moulding units because the Patent’s claims spoke only of an existing moulding unit on a moulding apparatus (5) and three additional moulding units (5a, 5b, 5c). The mounting of any additional moulding units to such moulding apparatuses was therefore outside the Patent. Even if the moulding apparatus actually manufactured by the Respondent allowed for the mounting of more than three additional moulding units, such use was simply the prerogative of the customer and beyond the monopoly of the Patent.

43 We do not accept these submissions. A patent is to be interpreted not aridly but purposively (see, *eg*, *FE Global* and *Bean Innovations*). In our view, the Patent adequately expressed the inventive concept of unlimited modularity of the moulding units in a moulding apparatus. The reference to the three additional moulding units (5a, 5b, 5c) therein was merely representative, not

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<sup>22</sup> 3ROP875 (NE)

<sup>23</sup> 3ROP902 (NE)

*(cont’d on next page)*

exhaustive, of the number of additional moulding units that could be attached to the moulding apparatus.

44 The notion that unlimited modularity of moulding units was the essence of the Patent was borne out in the evidence of Dr Pecht who agreed that “a person skilled in the art would understand the modular concept” of the Patent.<sup>24</sup>

COURT The issue now is what does the patent speak to? What does it talk about? What does it tell us the claim is about?

So the issue, the plaintiffs say, is that the way that they have described it in the patent specs and the claim, looking at the drawings, a person skilled in the art would understand the modular concept of the whole thing. In other words, I have a moulding unit with the ancillary materials-handling part of it, and in order to -- if I want to expand my production capacity, I just add, what do you call them, detachably mountable, another moulding unit and that doubles my capacity. And if I want to double it further, I add two more. So that is the claim.

Of course, how easily it is mountable --

Dr Pecht I agree with that.

COURT You agree with that?

Dr Pecht Absolutely.

COURT So the question, if that is the case -- I mean, whether that is patentable as a valid claim or not, that we will examine later on, but if you agree with that, at least we have sort of defined and agree on what their claim is.

Dr Pecht Yes, Your Honour.

45 Indeed, the Appellant appeared to accept in its Case and written submissions that unlimited modularity of moulding units in a moulding

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<sup>24</sup> 3ROP868 (NE)

apparatus was the essence of the Patent. In attempting to demonstrate that such invention had been anticipated by the prior art, the Appellant asserted that the prior art (particularly Hitachi) taught unlimited modularity of moulding units.<sup>25</sup>

81. ... Hitachi disclosed, *inter alia*, the following:
- a) molding units in the form of mold press structures (11 — 16) (up to infinity) that are mounted "with respect to" each other;
  - b) the ability to change the number of molding units "freely" as also described in the Patent;
  - c) that the number of molding units is unlimited.

...

87. Bearing in mind that the Prior Art teaches the following,
- the ability to change the number of molding units;
  - the number of molding units was unlimited; and
  - increasing or decreasing molding units could be done easily;

there are no other features in Claim 4 that exist outside the scope of the Prior Art and the common general knowledge.

88. Hence, applying the legal test of novelty, Claim 4 is not novel *vis-à-vis* the prior art.

46 The Appellant agreed that it could have no quibble over whether the essence of the Patent was unlimited modularity of moulding units if the additional moulding units in the Patent were expressed as "(5a, etc.)" rather than "(5a, 5b, 5c)". We do not see any substantive difference in this linguistic distinction and thus reject it.

47 We do not accept the Appellant's further submissions that the Patent contemplated increasing beyond four the number of moulding units in a

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<sup>25</sup> A's Case [87]

moulding apparatus only during but not after the manufacture of such moulding apparatus. In support of this contention, the Appellant relied on two statements in the Patent: first, that Figure 4 (at [9] above) represented the “apparatus for moulding resin to seal electronic parts” that is the subject matter of the Patent<sup>26</sup> and, second, that the Patent granted the ability to “form an apparatus ... which is responsive to mass production”.<sup>27</sup> In our view, the first statement described not only Figure 4 but also Figure 2 (at [9] above), each of which depicted a moulding apparatus with different numbers of moulding units attached with respect to each other as “the apparatus” that is the invention in the Patent. The second statement also referred to the adjustment of the number of moulding units after the manufacture of the moulding apparatus, as evident from its context that the number of moulding units in the moulding apparatus could be “arbitrarily and simply adjust[ed] ... in response to the production capacity as required.” We reproduce below the relevant portion of the Patent:<sup>28</sup>

Therefore, it is possible to simply form an apparatus for molding resin to seal electronic parts which is responsive to mass production without increasing the mold itself in size. Further, it is also possible to simply form an apparatus for molding resin to seal electronic parts which can cope with small production without increasing the mold itself in size since the additional molding unit can be properly detached.

Namely, it is possible to arbitrarily and simply adjust the number of the molding units provided on the molding apparatus in response to the production quantity as required. Thus, it is possible to readily cope with small production and mass production at need for molding resin to seal electronic parts.

*According to this method, further, it is possible to **simply form an apparatus** for molding resin to seal electronic parts which is *responsive to mass production* without increasing the mold*

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<sup>26</sup> 2RSCB30 (Patent)

<sup>27</sup> 2RSCB9 (Patent)

<sup>28</sup> 2RSCB9–10 (Patent)

itself in size, whereby having products having high quality and high reliability can be produced in high efficiency with neither voids nor defective parts formed in the interior and the exterior of sealed compacts of electronic parts.

[Emphasis added]

48 We thus disagree with the Appellant that the Patent does not contemplate increasing beyond four the number of moulding units in a moulding apparatus after the manufacture of such moulding apparatus.

49 The Appellant observed that the Respondent’s customers had operated their moulding apparatuses with a maximum of four moulding units and that the optimal number of moulding units on the Respondent’s moulding apparatus appeared to be four.<sup>29</sup> However, this does not diminish the fact that the Patent contemplated the unlimited modularity of moulding units in a moulding apparatus so that more than three additional moulding units could be “detachably mounted” to the existing moulding unit in the moulding apparatus.

50 Accordingly, we do not accept the Appellant’s argument that the “confines of the Patent” were a moulding apparatus with no more than four moulding units.

*Inconsistent interpretations of Patent*

51 The Appellant alleged that the Judge adopted inconsistent interpretations of the Patent: one when dealing with its validity and a different one when dealing with its infringement. He held that “the Patent does not concern the means by which modularity is achieved” (Judgment at [81] in the

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<sup>29</sup> 3ROP728 (NE)

*(cont’d on next page)*

context of whether retrofitting was an infringement of the Patent) after he had found that “[t]he Patent teaches how this modularity can be achieved” (Judgment at [22] in the context of the inventive step in the Patent).<sup>30</sup>

52 In our view, any inconsistency between these two statements is more apparent than real. The inventive step in the Patent is a moulding apparatus with the feature of modularity, with provision for additional moulding units to be “detachably mounted” in relation to the existing moulding unit(s) of the moulding apparatus. In that context, the Judge described the inventive step as follows, in an echo of the language of process Claim 1 (Judgment at [22]):

The Patent teaches how this modularity can be achieved by having molding machines with molding units which are ‘detachably mountable’ (i.e. detachable and attachable) to each other...

53 In consequence, the capability that Claim 1 professes to teach in realisation of “modularity” is the concept of having additional moulding units that are detachable/mountable with respect to the existing moulding unit(s) of a moulding apparatus. This is far broader than a claim only as to the specific means or the mechanics by which such additional moulding units are mounted to or detached from a moulding apparatus, which was in essence the construction of Claim 1 that the Appellant urged us to apply in order to show that its “retrofitting” service fell outside the scope of Claim 1. In other words, Claim 1 extends to any and every means by which additional moulding units could be rendered detachable/mountable with respect to the existing moulding unit(s) of a moulding apparatus. The Patent, therefore, “does not concern the [specific] means by which modularity is achieved”.

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<sup>30</sup> AC [30]–[31]

54 Accordingly, we do not think that there was inconsistency with the two parts of the Judgment.

*Evidence of Mr Tabata*

55 The Appellant contended finally that Mr Tabata lacked the “qualities [that] the relevant person skilled in the art of the Patent would possess” and gave few, if any, reasons for his opinion.<sup>31</sup> Further, the Judge erred in accepting Mr Tabata’s evidence without considering these limitations.

56 We reject these submissions. They are unsubstantiated assertions that were not borne out by the evidence. In the proceedings below, there was no serious debate that Mr Tabata was a person skilled in the art of the Patent. The Appellant did not cross-examine Mr Tabata on his qualifications as such a skilled person. Accordingly, there was no reason for the Judge to have examined the qualifications of Mr Tabata in detail in his Judgment.

57 In our view, too, the Judge considered and weighed carefully the expert evidence before deciding to prefer the evidence of Mr Tabata. Take the definition of a “moulding unit” as an example. The Judge analysed the differing views of Mr Tabata and Dr Pecht before preferring the interpretation put forth by Mr Tabata on the ground that it was more consistent with the description of the invention in the Patent (see [17(a)] above; see also Judgment at [23]–[28]). Similarly, on the definition of “freely increasing/decreasing”, the Judge set out his understanding of each of the views of Dr Pecht and Mr Tabata and then gave a reasoned explanation for his decision to prefer the evidence of Mr Tabata (see [17(b)] above; see also Judgment at [29]–[30]).

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<sup>31</sup> AC [36]–[40]

58 Accordingly, we see little reason to interfere with the Judge’s decision to prefer Mr Tabata’s evidence.

**Novelty**

59 The requirement of novelty is prescribed by s 13(1)(a) of the Patents Act. An invention is novel if it does not form part of the state of the art (s 14(1) of the Patents Act) in that it has not been anticipated by any of the pieces of prior art (Ng-Loy Wee Loon, *Law of Intellectual Property of Singapore* (Sweet & Maxwell, 2nd Ed, 2014) at para 30.1.25). A piece of prior art anticipates an invention only if the directions therein are so clear that a skilled addressee following those directions must inevitably produce something that would, if the patentee’s patent were valid, infringe the patentee’s claim (*Mühlbauer AG v Manufacturing Integration Technology Ltd* [2010] 2 SLR 724 (“*Mühlbauer*”) at [17]). Each piece of prior art can be compared against the invention in the Patent only separately. The party resisting the patent cannot assemble all the pieces of prior art together in a “mosaic” and then compare the invention in question against the “mosaic” (*Mühlbauer* at [68]). The burden of proving anticipation rests on the party resisting a patent claim (*Main-Line Corporate Holdings Ltd v United Overseas Bank Ltd* [2007] 1 SLR(R) 1021 at [53]).

60 It is undisputed that there were only three pieces of prior art as at the Priority Date that were relevant: NEC, Hitachi and ASA 808K.<sup>32</sup>

61 The Appellant submitted that NEC, Hitachi and ASA 808K each anticipated the unlimited modularity of moulding units that was the subject

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<sup>32</sup> 2ACB7 (Expert Joint Statement)

(cont’d on next page)

matter of the Patent’s claims.<sup>33</sup> Specifically, the prior art taught the ability to: (a) change the number of moulding units; (b) add an unlimited number of moulding units to a moulding apparatus and (c) increase and decrease the number of such moulding units easily.<sup>34</sup> The Appellant added that any structural differences (such as a tabletop in NEC or a base plate in ASA 808K) between the prior art and the Patent did not derogate from the modularity already present in the prior art and known in the common general knowledge of a person skilled in the art.<sup>35</sup>

62 In our judgment, the prior art did not anticipate the invention in the Patent. We set out our analysis of each piece of prior art, beginning with ASA 808K, on which the Appellant focused primarily in its appeal.

*ASA 808K*

63 The Appellant argues in its Case and written submissions that ASA 808K contemplates modularity of moulding units because an ASA 808K moulding apparatus is “designed to operate with a variable number of moulding units.” An ASA 808K moulding apparatus was sold and operated with only three moulding units. This was one moulding unit less than its designed capacity of four moulding units. The fourth moulding unit was installed only after the moulding apparatus had been shipped to the customer. ASA 808K thus contemplated a moulding apparatus to which moulding units could be attached

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<sup>33</sup> AC [72]

<sup>34</sup> AC [87]

<sup>35</sup> AC [83]–[84]

*(cont’d on next page)*

and from which moulding units could be removed even after the moulding apparatus was manufactured.<sup>36</sup>

64 The Appellant crystallised its arguments in its oral submissions into two related features of ASA 808K that it claimed demonstrated anticipation of the invention in the Patent. First, ASA 808K provided the ability to mount additional moulding units to and detach additional moulding units from a moulding apparatus after the moulding apparatus was shipped to the customer and that such a moulding apparatus could operate with any number from one to four moulding units. Second, ASA 808K, though subject to a “technical limitation” of a moulding apparatus with a maximum of four moulding units, nevertheless anticipated the invention in the Patent which contemplated a moulding apparatus with a maximum of four moulding units (see [42] above).<sup>37</sup>

65 Given our finding that the Patent contemplated a moulding apparatus with unlimited modularity of moulding units (at [43]–[50] above), ASA 808K with its “technical limitation” of a moulding apparatus with a maximum of four moulding units did not anticipate the invention in the Patent. ASA 808K entailed a moulding apparatus with its moulding units attached to a base plate that was custom built for exactly four moulding units. This left no space for the attachment of any additional moulding units. Although an ASA 808K moulding apparatus could operate with some of its moulding units removed, this capability did not allow production capacity to be increased beyond four moulding units. Such unrestricted increase was the essence of the Patent (see Judgment at [55]–[59]).

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<sup>36</sup> AC [75]–[76]

<sup>37</sup> A’s Oral Subs 16/8/17

66 Further, although ASA 808K provided for a moulding apparatus to operate even with one (or some) of its full complement of four moulding units removed, it was unclear that such a moulding apparatus was designed for the frequent removal (and, more importantly, attachment) of the moulding units. The Appellant adduced no evidence to show that the instance where an ASA 808K moulding apparatus was shipped to a buyer with only three moulding units (with the fourth moulding unit attached subsequently) was anything other than an isolated occurrence necessitated by circumstance rather than by choice. By comparison, the Patent disclosed a moulding apparatus that allowed its user to “arbitrarily and simply adjust the number of moulding units ... to readily cope with small production and mass production”<sup>38</sup> (see excerpt at [47] above).

67 Accordingly, we find that the Appellant was not able to discharge its burden of proving that ASA 808K anticipated the invention in the Patent.

*NEC*

68 The Appellant asserted in its Case and written submissions that NEC contemplated modularity of moulding units because it disclosed (a) moulding units in the form of mould press structures that were mounted “with respect to” each other; (b) an ability to change the number of such moulding units; and (c) multiple number of “press structures”.<sup>39</sup> The Appellant added in its oral submissions that an ability of change the number of moulding units in a

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<sup>38</sup> 2RSCB10 (Patent)

<sup>39</sup> AC [78]

*(cont'd on next page)*

moulding apparatus was “general knowledge” and that increasing/decreasing the number of moulding units in a moulding apparatus could be done easily.<sup>40</sup>

69 We reject these submissions for the same reasons given by the Judge (see Judgment at [46]–[48]). NEC entailed a moulding apparatus with its moulding units affixed to a tabletop of fixed dimensions. This configuration did not allow space for the attachment of any additional moulding units. Although the number of moulding units that comprised the moulding apparatus in NEC could be adjusted during the manufacture of the moulding apparatus, this did not anticipate any increase in the number of moulding units after the manufacture of the moulding apparatus. In contrast, a moulding apparatus in the Patent involved moulding units mounted with respect to each other, rather than with respect to a base plate. This allowed the number of moulding units in such moulding apparatus to be increased even after the manufacture of the moulding apparatus.

70 We also reject any suggestion by the Appellant that NEC provided for unlimited modularity of moulding units because it provided for a multiplicity of “mould press structures”.<sup>41</sup> This suggestion implied that the “mould press structures” in NEC corresponded to the “moulding units” in the Patent.<sup>42</sup> However, the modularity of “mould press structures” was not borne out by the evidence, particularly Figure 1 of NEC as follows.<sup>43</sup>

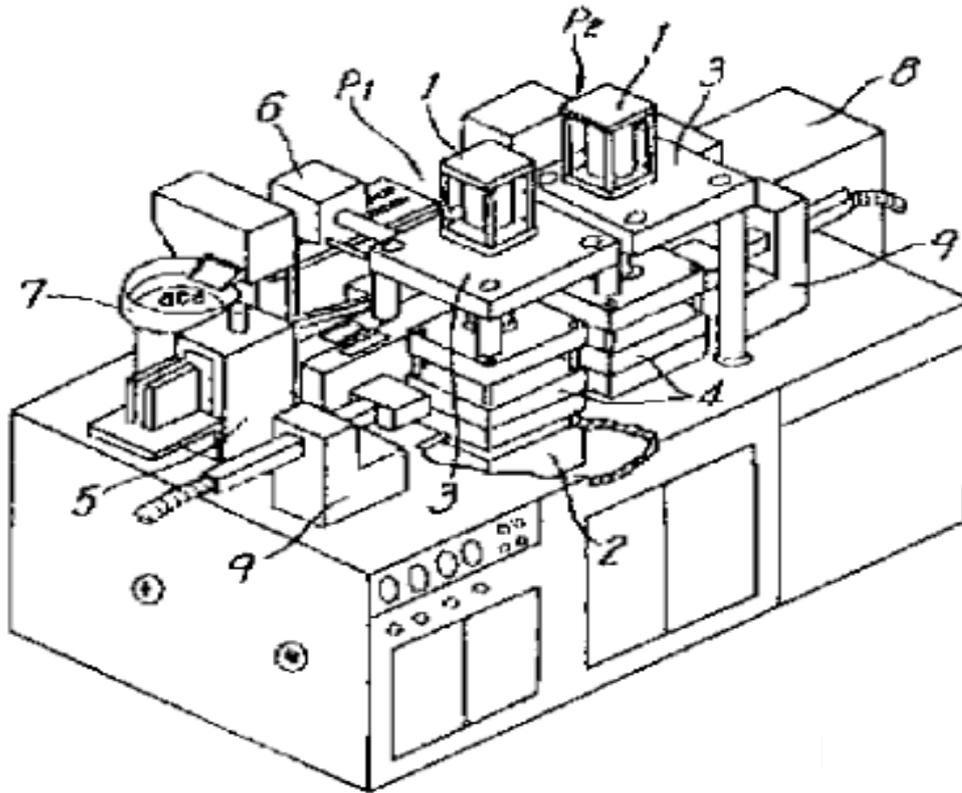
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<sup>40</sup> A’s Oral Subs 16/8/17

<sup>41</sup> AC [78]

<sup>42</sup> 3ROP251 (Dr Pecht’s Report)

<sup>43</sup> 2ACB146 (NEC)



71 As Figure 1 of NEC depicts, the “mould press structures” in NEC include not only the mould (4) but also the mould press (1, 3). The only parts of NEC that were modular or interchangeable were the “metal moulds with a small number of cavities”, as Dr Pecht deposited.<sup>44</sup> It does not follow that the entire “mould press structure” possessed the feature of modularity.

72 Accordingly, NEC did not anticipate the invention in the Patent.

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<sup>44</sup> 3ROP360 (Dr Pecht’s Report)

*Hitachi*

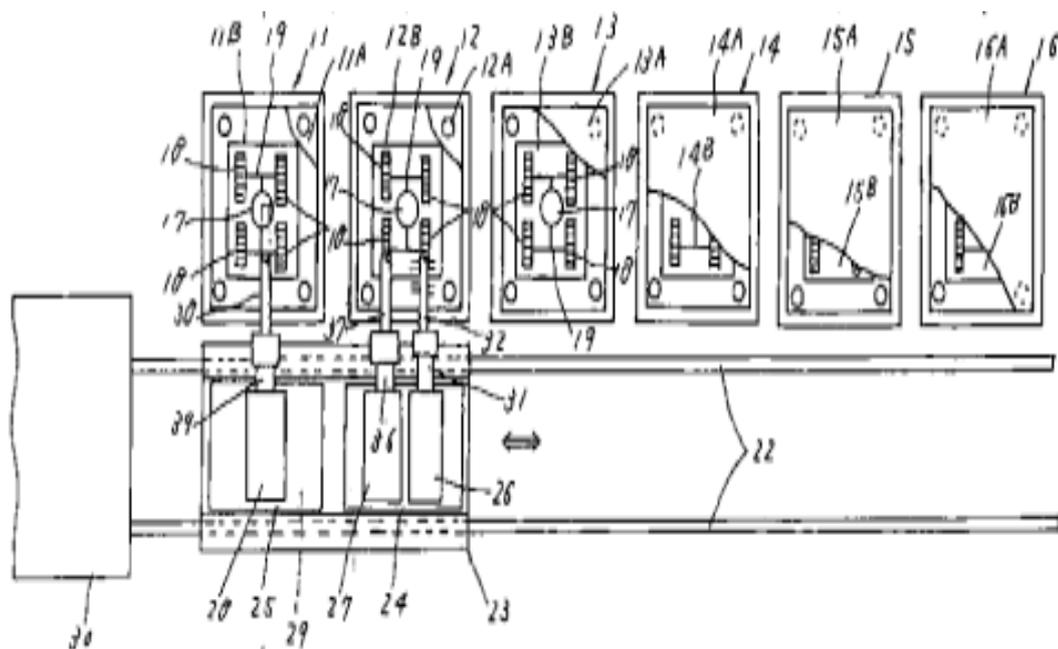
73 The Appellant contended in its written submissions that Hitachi contemplated unlimited modularity of moulding units because it disclosed (a) moulding units in the form of mould press structures (up to infinity) that were mounted “with respect to” each other (b) an ability to change the number of moulding units “freely” and (c) provision for an unlimited number of moulding units.<sup>45</sup> The Appellant added in its oral submissions that Hitachi involved a moulding apparatus with moulding units mounted with respect to rails and not to a base plate, which allowed for an infinite number of moulding units to be connected in a moulding apparatus.<sup>46</sup> The Appellant relied on Figure 1 of Hitachi, which depicted the moulding units (11, 12, 13, 14, 15, 16) and the rails (22) in the moulding apparatus as follows:<sup>47</sup>

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<sup>45</sup> AC [81]

<sup>46</sup> A’s Oral Subs 16/8/17

<sup>47</sup> 2ACB153 (Hitachi)



74 Once again, we reject these submissions for the same reasons given by the Judge (Judgment at [49]–[54]). Hitachi entailed a moulding apparatus with interchangeable moulds but not interchangeable moulding units. Such interchangeability caters only for the maintenance of worn out cavities and/or the alteration of design requirements. However, a mould is only a subset of a moulding unit which comprises not only the mould but also the pressing mechanism. The mere fact that the moulds in Hitachi were modular or interchangeable did not bear out the Appellant’s contention that Hitachi provided for modularity of moulding units.

75 The Appellant’s contention that the moulding units in Hitachi were mounted on rails (see (22) in Figure 1 of Hitachi), rather than with respect to a base plate, did not take it far. The rails were designed not for the mounting of moulding units but for guiding a robot that cleaned the moulds on the moulding apparatus, fed resin tablets into the moulds and loaded and unloaded lead frames

into and out of the moulds.<sup>48</sup> More importantly, the Appellant offered no evidence to the effect that the rails (and the robot that operates on them) could accommodate an infinite number of moulding units.

76 In any event, any suggestion that the moulding apparatus in Hitachi could accommodate an infinite number of moulding units was limited to varying the number of moulding units during the manufacture of such moulding apparatus. Once the manufacture of such moulding apparatus was completed, the number of moulding units therein was fixed. There was no evidence that such a moulding apparatus could continue to operate with one or more moulding units removed.

77 Accordingly, Hitachi did not anticipate the invention in the Patent.

### ***Inventiveness***

78 The requirement of inventiveness or non-obviousness is prescribed by s 13(1)(b) of the Patents Act. A claimed invention is inventive if it is not obvious to a person skilled in the art, having regard to any matter that forms part of the state of that art as of the priority date of the invention (s 15 of the Patents Act). This involves a four-step analysis, with the party resisting a patent claim bearing the burden of proving the absence of an inventive step (*Mühlbauer* at [19]–[20] endorsing *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd* [1985] RPC 59 (“*Windsurfing*”) at 73–74):

- (a) First, identify the inventive concept embodied in the patent.

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<sup>48</sup> 2ACB157 (Hitachi)

- (b) Second, assume the mantle of the normally skilled but unimaginative addressee in the art at the priority date. Impute to such addressee the contents of the common general knowledge in the art in question as at the priority date.
- (c) Third, identify the differences (if any) that exist between the contents of the common general knowledge as at the priority date and the claimed invention.
- (d) Fourth, ask whether, viewed without any knowledge of the alleged invention, those differences constitute steps that would have been obvious to the skilled addressee, or whether they require any degree of invention. In doing so, the skilled addressee may, unlike in the novelty inquiry, construct a “mosaic” out of the various pieces of prior art, unless such act of constructing a “mosaic” would itself not be obvious to the notional skilled addressee (*Mühlbauer* at [93]).

79 The Appellant argued in its Case and written submissions that the IDEALmold machine merely embodied the teaching of an apparatus previously disclosed in NEC, Hitachi and ASA 808K without substantial or patentable variation.<sup>49</sup> The “mere” concept of modularity was an abstract idea that could not be monopolised by the Respondent via a patent. Rather, the monopoly of the Patent had to reside in its “teaching as to how ‘modularity’ was to be achieved.” As the Patent was silent on retrofitting as a means of achieving such

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<sup>49</sup> AC [99]

(cont'd on next page)

modularity, the IDEALmold machine could not have infringed the Patent insofar as it could be retrofitted to achieve modularity.<sup>50</sup>

80 As the Judge observed in rejecting the Appellant’s claim that the Patent lacked an inventive step, the Appellant made no meaningful attempt to compare the invention in the Patent with the prior art (Judgment at [60]–[63]). Further, the Appellant offered no evidence that the differences between the invention in the Patent and the prior art were obvious to a person skilled in such art. Dr Pecht’s opinion was that the invention in Claim 4 of the Patent did not involve an inventive step simply because it was anticipated by the prior art. Given our agreement with the Judge on the issue of the prior art, it follows that the Appellant has failed to discharge its burden of proving that the Patent lacked inventiveness.

81 The Appellant in its oral submissions did not appear to adopt the evidence of Dr Pecht that the Patent lacked inventiveness and made only a bare assertion that an ability to increase or decrease the number of moulding units in a moulding apparatus was general knowledge.<sup>51</sup> However, the common general knowledge at the relevant time, as summarised by Dr Pecht in his expert report, did not include attachment of additional moulding units to or detachment of additional moulding units from a moulding apparatus that is the essence of the modularity of moulding units under the Patent:<sup>52</sup>

[I]t was common general knowledge (as explained in the [P]atent itself) to have a molding machine with a plurality of resin supply pots; plurality of resin pressurizing plungers; a lead frame alignment unit; a de-gating unit for removing gates from sealed

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<sup>50</sup> AC [101]

<sup>51</sup> A’s Oral Subs 16/8/17

<sup>52</sup> 3ROP250 (Dr Pecht’s Report)

lead frames; a pickup unit for picking up de-gated sealed lead frames independently of each other for storage; each molding unit or press is provided with a fixed plate which is fixed to an upper part of an apparatus body through fixing means, namely by connecting screws; and a controller unit ...

82 Accordingly, we do not agree with the Appellant that the invention in the Patent lacked inventiveness.

### *Infringement*

83 There was no real dispute between the parties that apart from the invention in the Patent – modularity – the IDEALmold machine had all the remaining features of the Patent’s claims.<sup>53</sup> It could not be seriously disputed, too, that the IDEALmold machine comprised modular moulding units connected to each other. Further, the Appellant admitted to offering to buyers of IDEALmold machines the option of subsequently increasing and decreasing the number of moulding units of the IDEALmold machine through a “retrofitting” process.<sup>54</sup> The Appellant also did not dispute that this “retrofitting” process permits an unlimited number of moulding units to be attached to an IDEALmold machine.<sup>55</sup>

84 The concept of infringement is defined in s 66(1) of the Patents Act, which reads:

#### **Meaning of infringement**

**66.**—(1) Subject to the provisions of this Act, 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 Singapore in

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<sup>53</sup> 2ACB8 (Experts’ Joint Statement)

<sup>54</sup> 3ROP784–785 (NE)

<sup>55</sup> 3ROP1209–1210 (A’s Subs below)

relation to the invention without the consent of the proprietor of the patent:

- (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 Singapore when he knows, or it is obvious to a reasonable person in the circumstances, that its use without the consent of the proprietor would be an infringement of the patent;

...

85 The Appellant argued that its sale of the IDEALmold machines did not amount to carrying out all the steps as claimed in Claims 1 and 2 because such post-sale steps as “molding resin to seal electronic parts” were performed not by it but by the buyers of the IDEALmold machines.<sup>56</sup> The Appellant, however, did not dispute that the alleged acts of infringement took place in Singapore.

86 In our view, the Appellant infringed Claims 4 and 5 of the Patent in making and selling the IDEALmold machines in Singapore (see s 66(1)(a) of the Patents Act). This is clear from its admission in its Defence and Counterclaim:<sup>57</sup>

The Defendants aver that the 1<sup>st</sup> Defendant [*ie*, the Appellant] has been in the business of manufacturing and selling molding systems, being the IDEALmold machine, since on or around 1999/2000 (including having International Rectifier Mexico as a customer on or around 2010) ... and that the 1<sup>st</sup> Defendant is one of the Plaintiff’s [*ie*, the Respondent] competitors.

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<sup>56</sup> AC [102]

<sup>57</sup> RSCB 159 (Defence and Counterclaim)

87 As for whether the Appellant infringed Claims 1 and 2 of the Patent, we agree with the Judge that the Appellant must, in selling and offering for sale the IDEALmold machine, be taken to have offered the incorporated infringing process for use under s 66(1)(b) of the Patents Act. It is inconceivable that the Appellant manufactured the IDEALmold machines without knowing how they would work. Further, it would be untenable if a patent proprietor who has only a process patent cannot stop a manufacturer or seller of a product that incorporates an infringing process and must take action instead against the individual users of that product.

88 The Appellant’s contention that “[t]he mere supply of the [IDEALmold] Machines by the Appellant *per se* does not mean that the Appellant has used an infringing process”<sup>58</sup> relied on the decision of the UK Court of Appeal in *Fabio Perini SPA v LPC Group PLC and Ors* [2010] EWCA Civ 525 (“*Fabio Perini*”) at [27].<sup>59</sup> However, that passage from *Fabio Perini* does not assist the Appellant. It states only, “it is not at all safe to assume that, when a patent is dealing with a process claim, it uses every expression to mean the same thing as when it is dealing with an apparatus, or product, claim”. It does not detract from the force of the argument that the supply of a product that incorporates an infringing process, where the supplier intends the purchaser of the product to use the product with the process therein, amounts to the offering for use the infringing process.

89 On the Appellant’s contention that retrofitting was complex, costly and time-consuming and that the IDEALmold machine fell outside the scope of the

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<sup>58</sup> A’s Subs at [8(v)]

<sup>59</sup> A.SBOA Tab 2

patent’s claims, the Judge found that the cost of retrofitting a three-moulding unit IDEALmold machine to add an additional moulding unit was US\$250,000, whereas the cost of purchasing an additional one-unit moulding apparatus was US\$413,000 (Judgment at [88]). The cost of retrofitting was therefore almost two-thirds that of purchasing a new moulding unit. The Respondent’s uncontested explanation in oral arguments was that approximately half of the costs of a new moulding unit went towards the purchase of the mould.<sup>60</sup> In any event, the Judge found that the Patent covered machines which had the feature of modularity and that it was “irrelevant that this modularity is achieved through means which are complex, costly and time-consuming” (Judgment at [85]). We see no reason to disagree with the Judge on this point.

### ***Groundless threats***

90 As we agree with the Judge that the Appellant infringed the Patent, the issue of whether the Respondent made groundless threats of infringement proceedings under s 77 of the Patents Act does not arise for decision.

### **Conclusion**

91 For the above reasons, we dismiss the appeal with costs.

92 The Judge ordered an inquiry on damages or, alternatively, at the Respondent’s option, an account of profits. Bearing in mind the limitation period of six years accepted by the Respondent (see [28] above), the damages or account of profits for infringement of the Patent will run from 20 April 2007 (six years before the Respondent filed its writ of summons in this action on 19

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<sup>60</sup> R’s Oral Subs 16/8/17

April 2013) to 5 July 2014, the date just before the Patent expired on 6 July 2014.

93 For the trial in the High Court, at the request of the parties after the Judgment was delivered, the Judge ordered that the issues on costs be determined after the Court of Appeal decides this appeal. We propose to fix the costs for this appeal, taking into consideration the Costs Schedules submitted by both parties. The Appellant submitted costs at \$120,000 with disbursements amounting to \$5,500 while the Respondent submitted at \$100,000 and \$5,827 respectively. We award costs for this appeal at \$85,000 (inclusive of disbursements) to be paid by the Appellant to the Respondent. We also make the usual consequential order relating to the security for costs for this appeal.

Sundaresh Menon  
Chief Justice

Andrew Phang Boon Leong  
Judge of Appeal

Tay Yong Kwang  
Judge of Appeal

Stanley Lai Tze Chang SC and Vignesh Vaerhn (Allen & Gledhill LLP) (instructed) and Lim Ying Sin Daniel (Joyce A Tan & Partners) for the appellant;  
Low Chai Chong, Long Ai Ming, Foo Maw Jiun, and Quek Jie Ying (Dentons Rodyk & Davidson LLP) for the respondent.

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