[2013] EWPCC 4

Case No: CC12 03466

IN THE PATENTS COUNTY COURT

Rolls Building
7 Rolls Buildings
Fetter Lane
London EC4A 1NL

Date: 05/02/2013

Before :

HIS HONOUR JUDGE BIRSS QC

- -

Between :

ENVIRONMENTAL RECYCLING TECHNOLOGIES PLC	**Claimant**
- and -	
UPCYCLE HOLDINGS LIMITED	**Defendant**

- -

- -

Dr Heather Lawrence (instructed by **Shakespeares**) for the **Claimant**
Martin Howe QC (instructed by **Bird & Bird**) for the **Defendant**

Hearing dates: 5th, 6th December 2012

- -

Approved Judgment

I direct that pursuant to CPR PD 39A para 6.1 no official shorthand note shall be taken of this Judgment and that copies of this version as handed down may be treated as authentic.

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HIS HONOUR JUDGE BIRSS QC

His Honour Judge Birss QC :

Contents

Introduction

1. In this case the claimant (ERT) contends that UK Patent 2 460 838 entitled "Process for moulding plastic articles" is invalid. The patent was filed on 9th June 2008 without claiming priority from an earlier filing. It belongs to the defendant (Upcycle). Dr Heather Lawrence instructed by Shakespeares appears for ERT and Mr Martin Howe QC instructed by Bird & Bird appears for Upcycle.

2. The case relates to a process called "PIM", i.e. powder impression moulding. This is a relatively new technique invented by the claimant or its predecessors or individuals associated with them at one time or another. The aspect of the PIM technique which matters for this case is as follows. Two separate moulds in the form of trays are heated. Powdered plastic material is placed on the heated surface of each mould. The plastic softens and forms a skin. Special "foamable" plastic material in then placed inside the lower tray. The upper tray is turned over and placed on top of the lower tray. Heat is applied and this causes the foamable plastic to foam up and fill up the space. The skins also merge together at the edges. Once the product is cooled, the two moulds are opened and a rigid plastic article is made. Examples of the sorts of things which can be made this way include plastic panels about 1m x 1m square and about 2cm thick.

3. The case began in the High Court in June 2010. It was transferred to the Patents County Court in July 2012 with a trial fixed for December 2012.

4. In the course of the proceedings Upcycle applied to amend the patent. Upcycle does not defend the validity of the claims in their unamended form. As proposed to be amended the patent has two claims. The important claim is new claim 1. This consists of granted claims 1, 2, 4, 5 and 12. As amended the patent will also have a new claim 2 which was original claim 13. Upcycle does not contend that claim 2 (as

amended) is independently valid. Thus the only claim which matters for validity is new claim 1. A point arises on new claim 2 because it is an omnibus claim and ERT contends an amendment leaving it in place should not be permitted.

5. The substantive points in this case are:

   i) Whether the amendments are allowable. ERT contends new claim 1 would add matter and the amendment therefore should not be permitted. ERT also takes the omnibus claim point on new claim 2.

   ii) Whether new claim 1 is obvious over two items of prior art: Aylmore (published PCT application PCT/GB2006/001541 published as WO 2006/114632 on 2 November 2006) and a prior use known as "Contour". This was a powder impression moulding process for making shower trays at a factory in Bedwas, Caerphilly, South Wales. The shower trays were for Contour Showers Limited.

6. Each side called an expert witness:

   i) ERT called Mr Colin Williamson. He has been working in the plastics industry since the late 1960s. Since 1987 Mr Williamson has been a consultant specialising in technical aspects of plastics and other industries. He has a particular interest and knowledge of plastics recycling, plastics raw materials and additives, plastics processing and plastics conservation. He also has a particular interest in the history of plastics and polymer technology and maintains a library on the subject. He is the owner of a plastics recycling company (Smile Plastics Ltd). In 2011 he received a Lifetime Achievement Award for his contribution to the plastics industry because of his work in recycling.

   ii) Upcycle called Dr Andrew Peter Cox. He has worked in polymer processing for over 35 years in a variety of roles. His undergraduate degree was in mechanical engineering from Imperial College and his PhD related to creep properties of a nickel alloy. After a period at Rolls Royce in the 1970s working on the failure of gas turbine blades and a short period in the early 1980s working on computer modelling, since then Dr Cox's work has been very practically based. In the mid 1980s he worked on rubber hoses for the offshore oil industry and from 1987 Dr Cox was a Senior Engineer in the Plastics Section of the Metal Box Research and Design Centre in Wantage. His primary focus was on developing a production process for a stretch blow moulded multilayer structure. In 2001 he set up Peter Cox Associates, a consultancy firm dealing with polymer processing.

7. The differences in their experience meant that Mr Williamson's focus was more towards plastics recycling whereas Dr Cox had what might be called an engineering approach to materials. However both were well qualified to give evidence on the issues arising in this case. Neither witness was criticised by counsel. They both gave their evidence fairly.

8. I should record that Mr Williamson explained in his first report that he had been approached in 2004 to join the board of the claimant (then called 3DM Worldwide

Plc). He declined to do so. Mr Howe did not suggest that this had any material impact on his evidence. I agree.

9. I also heard evidence from three witnesses called by the claimant on the issue of prior use. They were Mr Niall John Mackay, Mr Richard Bayfield and Mr Christopher Livingston-Campbell. Mr Howe did not criticise their evidence. They also gave their evidence fairly.

The Contour prior use

10. By the conclusion of the trial the facts in relation to the Contour process were clear. The Bedwas factory was being used as a showcase for the PIM process. Numerous individuals of all kinds, such as potential investors and potential customers, were being shown around the factory without any express terms of confidentiality being imposed on them. On the other hand, as Mr Livingston-Campbell explained, some people were required to sign confidential disclosure agreements or CDAs before being shown what was going on at Bedwas. Thus the defendant had been going to call Mr Stillwell (of the defendant) as a witness to attest to the fact the he had been required to sign a CDA in those circumstances. In the result however, since it was accepted that CDAs had been required sometimes, there was no need to call Mr Stillwell.

11. Mr Howe submitted that the CDAs showed that what was going on inside Bedwas was not made available to the public. He relied on an article written by a journalist and published in July 2004 entitled "3DM shrouds PIM process in secrecy". He referred to ***Lux Traffic Controls v Pike Signals*** [1993] RPC 107 and pointed out that the onus was on the claimant. He also observed that much of the evidence from the claimant's witnesses was second hand or was not concerned with the Contour process but with other lines at the Bedwas plant (the so called alpha and beta lines).

12. The evidence given by Mr Livingston-Campbell, which I accept, is that ERT (and EPT, who were running the Bedwas plant in 2008) were very open about the general principles of PIM technology but that the detailed know-how, which Mr Livingston-Campbell called the "dark art", was kept very secret. That is the explanation for the fact that many people came to Bedwas without having to sign a CDA but others had to. It explains the "shrouded in secrecy" article since, despite its title, the article includes a generalised outline of the PIM process but no details.

13. Mr Livingston-Campbell had said that no express or implied obligation of confidence was imposed on various people he characterised as tradesmen who visited the factory over the years. The term tradesmen included people such as those delivering things to the factory. Such people were not subject to an implied duty of confidence but on the other hand such visitors would never have been permitted to discover the "dark art". To take an extreme example, I am sure that the staff at Bedwas would not have allowed a deliveryman to stand by a production line with a stop watch carefully measuring the timings of the various stages.

14. The Contour process was running at Bedwas in March/April 2008, before the filing date of the patent. Although the claimant called no specific evidence of a particular person who visited Bedwas and saw the Contour line in operation, I infer from the evidence of Mr Livingston-Campbell, Mr Mackay and Mr Bayfield as a whole that

visitors did come to Bedwas when the Contour line was in operation and before the priority date, saw that process in operation and were not required to sign a CDA. I also infer that "tradesmen" will have seen the Contour line at Bedwas in that period, again without any material obligation of confidence. None of these visitors (including the tradesmen) would have been allowed to discover any detailed operating information about the processes in operation. Thus they would not have discovered detailed timings, operating temperatures, specific process conditions, special additives, precise material formulations and the like. However I am sure that the general outline of the PIM process running on the Contour line was made available to the public.

15. By general outline of the process, I mean sufficient information to describe PIM in the manner I have done in paragraph 2 of this judgment, together with, and in the context of, the following further points: the moulds consist of two separate pieces, one has to be lifted to fit onto the other, the moulds are heated in an oven, the product actually being made is a shower tray, and the product being made has a drain hole which is made by using a plug which prevents any material (skin or foamable plastic) from entering the relevant region.

16. The nature of the Contour process itself was clear from a video clip which was in evidence. In effect what would have been apparent to a visitor or tradesman in Bedwas is the same as one can see from the video. No more and no less, save I suppose that one could always watch the video with a stopwatch and I do not think the staff at Bedwas would have permitted that in practice.

The person skilled in the art

17. It was common ground that the person skilled in the art in this case would be a manufacturer of moulded plastic articles who would have a working knowledge and experience of conventional plastics moulding processes and would have both engineering and chemistry skills. He (or she) would have a working knowledge of extrusion and injection moulding and a basic knowledge of rotational moulding, compression moulding and thermoforming. He would have practical hands-on experience in plastics processing.

18. There was a disagreement about the relevance of plastics recycling to the skilled person but in the end the point was of no significance. It was common ground that the skilled person would not be a specialist in recycling and that the patent would be of general interest regardless of recycling experience.

Common general knowledge

19. The main part of the relevant common general knowledge of the skilled person in this case related to various techniques for forming plastic articles.

20. In *extrusion* solid plastic particles or chips are melted in a heated barrel containing a mechanical screw and then forced through a die to create an article. It is a continuous process. Plastic pipes are made this way.

21. In *injection moulding*, the plastic material is melted in an extruder just as described above and then injected into a closed mould or tool where it sets in the designated

shape. Considerable pressure is needed for this process. The tool is cooled to solidify the plastic, opened and the finished article ejected. The tools used for this process are expensive but cycle times for each product are relatively short.

22. A point arises concerning the heating and cooling of injection moulding tools. It was common ground that part of the common general knowledge included pumping liquid such as water or oil into holes in injection moulding tools in order to heat and cool them. The purpose of cooling the tools is obvious. As regards heating, the defendant and Dr Cox emphasised that the heating of the tool was not used to melt the plastic in the first place since that was done in the screw prior to injection. The tools were heated to maintain an appropriate raised temperature in order to ensure the plastic material flows appropriately throughout the mould. Mr Williamson agreed with this. It was all common general knowledge.

23. In *rotational moulding*, cold plastic material is poured into a cold, round, two-piece mould which is then slowly rotated in an oven. The metal gets hot and the plastic softens and sticks to the inside to the inside of the mould. The longer the mould rotates, the more plastic gets melted and the layer in the inside gets thicker. When sufficient time has elapsed the mould is cooled while still turning and the plastic solidifies. The moulds are relatively cheap but cycle times are relatively long.

24. A point arose about whether the use of heating and cooling pipes in a rotational moulding tool was common general knowledge. I remind myself that for something to form part of the common general knowledge, it is not enough for it to be known by some practitioners in the art (***Beloit v Valmet*** [1997] RPC 489). Mr Williamson did not accept that this method of heating and cooling in rotational moulding was well known. I accept his evidence. I think it is clear that the notional skilled person would have the basics of the rotational moulding technique as part of their common stock of knowledge and that would include heating the mould in an oven. It would not include heating or cooling pipes in this context.

25. In *compression moulding* plastic material is placed into the horizontal bottom half of a mould. The plastic material may be cold plastic particles or may be pre-warmed. The top half is lowered on top and the whole mould closed under hydraulic pressure. The mould is heated and the plastic flows into place. The mould is cooled and the finished sheet removed. Compression moulding has often been used for thermosetting plastic materials but has also been used for thermoplastic material. Thermosetting materials are irreversibly "cured" or set, usually by heat. They cannot be melted again. Thermoplastics soften when heated, harden when cooled and can soften again when heat is reapplied.

26. Again a point arose about the methods of heating and cooling compression moulds. Mr Williamson's view was that heating and cooling compression moulds using pipes in the moulds to deliver water or oil was common general knowledge. He exhibited some old literature from his historical archive to make that point good and referred to a compression moulding machine used at Smile Plastics which dated back to the 1920s. Dr Cox accepted that cooling compression moulds this way was something the skilled person would know as part of their common general knowledge but as to heating, the relevant technique would involve electric heating cartridges. These cartridges are similar to a single bar of an old fashioned electric fire inside a glass tube. A hole is drilled in the mould and the cartridge fits snugly inside.

27. There was also evidence that a similar arrangement would have been encountered by the skilled person as part of their training. Many educational laboratories have and had a hydraulic press used to demonstrate flow properties of plastics which had cartridge heaters and water cooling lines.

28. It is clear on the evidence that compression moulds can be and in the past have been heated using oil or water (or steam) pipes inside the moulds but I am not satisfied that this technique was sufficiently known to be part of the common general knowledge at the priority date (2008). On the other hand I accept that cartridge heaters and water cooling lines in a mould such as the hydraulic press referred to were common general knowledge.

29. In *thermoforming* a pre-made polymer sheet or film is clamped into a frame and heated to be pliable. The sheet is clamped over a mould and vacuum pressure is used to draw the sheet down over the mould.

30. There were other plastics forming techniques such as blow moulding and fluidised bed dip coating but nothing turns on them and the extent to which they were common general knowledge either in general or in detail does not matter.

31. The experts did not agree about whether the PIM process was itself common general knowledge. By the end of the case it did not seem to matter but Mr Howe rightly submitted that it could in principle be relevant to the way in which the skilled person approaches the prior art and the patent in the sense that someone reading a disclosure relating to a familiar process may approach the disclosure in a different way from a disclosure of a new technique.

32. The basic PIM process is described in a public patent application known in this case as "Dinello" (PCT/US02/03298 published on 15th August 2002 as WO 02/062550). The application was made by 3DM Technologies Inc., which is a company I understand to be associated with the claimant. The claimant's name was 3DM Worldwide Plc but in August 2007 changed its name to the present one. 3DM, the claimant and various licensees, including a company called VPTech in the USA, have been promoting the PIM technique for the last ten years. They attended various major trade shows like Interplas and the triennial "K" exhibition in Germany (with 3000 exhibitors and 250,000 visitors). As I mentioned above, the Bedwas factory was set up as a showcase. Mr Williamson knew about PIM from sometime before 2004. He was able to date that knowledge because he knew that he knew about PIM at the time he was invited to join the board of 3DM Worldwide Plc. Despite his interest and involvement in the plastics industry, Dr Cox did not know of PIM until becoming involved in this case. He did not think it was common general knowledge.

33. It may be their relative interest in recycling accounts for the difference between the two experts given that a key application of the PIM process is to use recycled plastic material as the foamable filler material. PIM was clearly being promoted to the industry at the relevant date (2008) but it was being promoted by essentially a single source or single group of people. It was not in use as a generally accepted manufacturing technique at that time. In some cases a new technique which has not yet been successfully applied on a large scale still forms part of the common general knowledge perhaps because of the interest it has excited. That is not this case. I am

not surprised that Dr Cox did not know of PIM. He was not in an unusual position. I find that the PIM process was not common general knowledge.

34. Aside from particular plastics forming processes, a point arose about using a former in a mould. It was clear that part of a skilled person's common general knowledge included the idea of using an item, which might be called a plug or former, to block off part of a mould in order to prevent plastic from flowing into that region.

The patent

35. The patent starts by explaining that the invention relates to a process for forming plastics articles with a sandwich construction, in particular having a continuous plastic skin enclosing a foamed core which may be made of recycled waste material. It refers to injection moulding as a well known technique and then turns to PIM, citing the Dinello application. For what it is worth I do not read this part of the patent as an admission that PIM itself is "well known".

36. The patent summarises the PIM process described in Dinello and states that no machine to operate this process efficiently has yet been developed. The existing set up has high capital costs given the need for ovens to heat the moulds and cranes or conveyors to move them. There is also a problem that ovens and convection heaters have high energy consumption and cause uneven heating of the mould, leading to an uneven surface finish. Handling the separate moulds is unsatisfactory and can lead to the formation of unsatisfactory seams. These are said to be the problems and limitations of the prior art which the invention seeks to address.

37. Following a series of consistory clauses the description then turns to the figures. Figures 1 and 2 show a mould as follows:

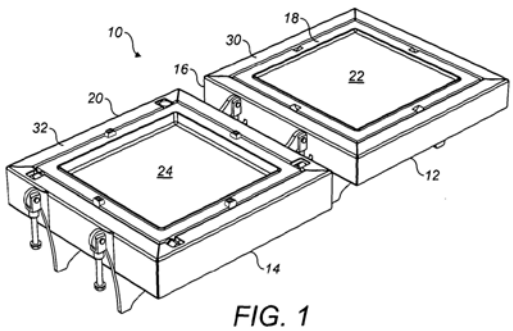


FIG. 1

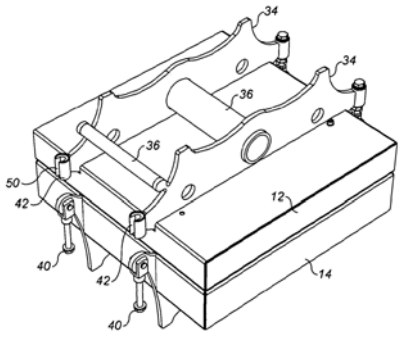
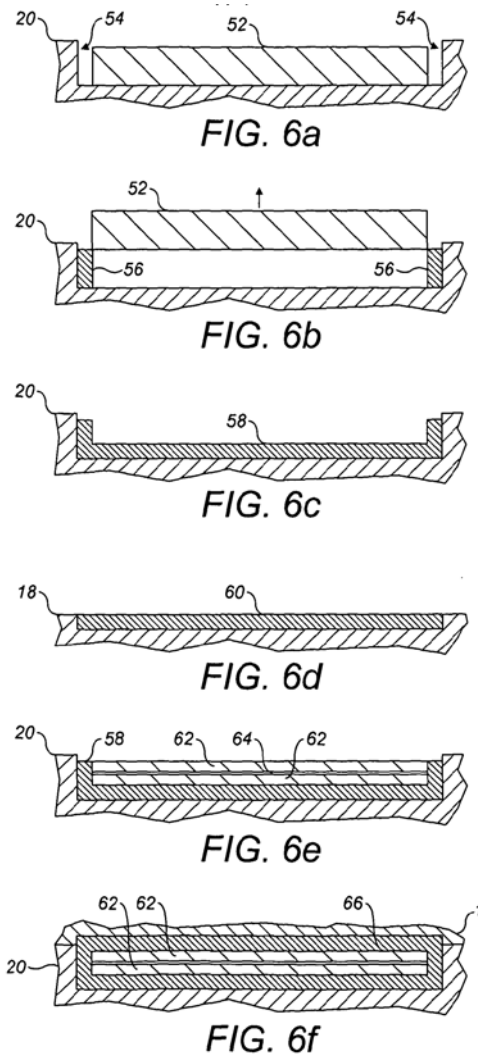


FIG. 2

38. The mould is formed in two parts hinged together. The mould cavity is defined by parts 22 and 24. In this example they are square. The moulds are formed with a network of channels (not shown in these figures) through which fluid can be piped to apply heat or to cool the mould. The channels can be operated selectively. This allows different regions of the mould to be selectively heated or cooled. The specification states that the devices for supplying heated or cooled oil are well known. However in saying that the document is not stating that the technique of heating and cooling this sort of mould in this sort of process was itself well known.

39. The moulds have insulating jackets (item 30 in fig 1) and reinforcing ribs are visible in fig 2 (items 34 and 36). The ribs prevent buckling in use. There are clamps (items 40 and 42) to secure the mould halves in a closed position.

40. The process of the invention is shown in Figure 6:



41. Initially both mould halves are open as in figure 1. The lower mould half (shown in fig 6a - 6c) is relatively deep (an example of 25mm is given). The upper half is shallow.

42. The moulds are heated by circulation of heated oil to a temperature high enough to melt the plastic which will be used to form the skin. For polyethylene the patent suggests a melting point of 190°C (that would be high density polyethylene) and a mould temperature of 220°C.

43. A former (item 52 in fig 6), for example made of wood, is placed into the lower mould cavity. It leaves a gap at the edges. Plastic material in the form of powder or granules is poured into the gap. This melts and forms a skin on the side walls. Excess plastic material may be removed if necessary. By making the former of a material of low thermal conductivity like wood, the plastic tends not to adhere to it, allowing the

former to be easily removed. Once the former is removed, more plastic material is placed on the base of the mould to form the bottom skin. It melts on contact. There is now a continuous skin in the lower mould cavity. For the top half (6d), plastic material is poured into the mould cavity and forms a skin in one step since it is shallow.

44. A foamable filler is placed in the lower cavity (6e). This could but need not consist of recycled plastic material. Other things can be added in the filler such as a layer of Kevlar for impact strength (item 64). The upper mould is then rotated on its hinges into the closed position on top of the lower half (6f) and secured by the clamps. The foaming agent in the filler is activated by heat. This can give rise to high pressure but the moulds have ribs to resist buckling. The moulds can be cooled by passing cooled oil through the channels. Then the moulds are opened and the finished article removed.

45. The description ends by explaining that the process can be done manually or automatically and is very energy efficient since the moulds are heated directly. There is no need for ovens and other expensive equipment for handling the moulds. The machine and process lends itself to inexpensive small scale production but can be scaled up too.

The claims

46. Claim 1, in its form as proposed to be amended, is set out below. The division into numbered integers is mine. The underlining shows features to be added by amendment:

(i) A process for moulding a plastic article using a machine comprising

(ii) a pair of moulds each defining a mould cavity, the moulds <u>being connected to each other by at least one hinge about which the moulds are pivotable and</u> movable between an open position in which the mould cavities are open and a closed position in which the moulds co-operate to define a completely closed mould cavity,

(iii) and means to heat and cool the moulds <u>by pumping heated or cooling fluid through channels formed in the moulds</u>;

(iv) the process comprising the steps of

(v) placing the moulds in the open position,

(vi) heating the moulds by conduction to a temperature above the melting point of a given plastic material,

(vii) placing the plastic material in particulate form into the moulds,

(viii) whereupon the plastic forms a skin lining each mould,

(ix) <u>wherein the step of forming a plastic skin in one of the moulds comprises</u>

> (x) placing a former in the mould cavity so as to leave a gap between the former and the side walls of the cavity,
>
> (xi) placing plastic material into the gap to form a plastic skin lining the side walls of the cavity,
>
> (xii) removing the former and
>
> (xiii) placing further plastic material on the bottom of the mould cavity to form a plastic skin lining the bottom of the mould and integral with the plastic skin lining the side walls,
>
> (xiv) placing expandable filler material in the plastic skin formed in one mould,
>
> (xv) closing the moulds to create a completely closed mould cavity,
>
> (xvi) whereupon the plastic skins in the moulds bond to each other to form a continuous plastic shell which completely encases the filler material,
>
> (xvii) cooling the moulds and opening the moulds to remove the moulded article,
>
> (xviii) wherein the process further comprises providing a reinforcement structure to resist buckling of the moulds and to act as a support for the moulds.

47. There was no debate about the proper construction of this claim. It can be seen that the claim is to a process which involves the use of a machine with certain features. The machine consists of a pair of moulds and a device for heating and cooling by pumping fluid through channels in the moulds. The moulds are hinged together and can be opened and closed to define a cavity. The basic process steps ((v)-(viii) and (xiv)-(xvii)) consist essentially of the usual PIM process steps. One point to note is that the step of heating the moulds (step vi) comes before the step of adding the plastic which will form the skin (step (vii)). The method also includes, at steps (ix) to (xiii), a process of using a former to form the plastic skin by making the side walls first using a former, then removing the former and adding more plastic to form the bottom base skin. Only after that is the expandable filler added.

48. Two points are worth mentioning as not being claimed in claim 1. The claim does not require that the heating and cooling channels must be able to be operated selectively so that (for example) the side walls could be cooled slightly while keeping the base hot. Carrying out that extra process step would be within the claim but the claim also covers a process in which that is not done. Also the claim does not require that the moulds have insulating jackets.

49. The only other claim as proposed to be amended is new claim 2. This provides:

> A process for moulding plastic articles substantially and hereinbefore described and with reference to the accompanying drawings.

The application to amend the patent

50. Once the action began the defendant applied to amend the patent to seek to further distinguish the invention claimed from the matter disclosed in the prior art. The defendant's position is that it does not accept the unamended patent would be invalid over the prior art relied on but does not seek to defend the unamended claims in this case. The amendment application is unconditional.

51. When the defendant first applied to amend the patent, the amendments were in a slightly different form. As is the normal practice the Comptroller commented on the proposal. Those comments raised some objections. The defendant reformulated the amendments into the form now sought before me and on 9th October 2012 a letter from the UK IPO confirmed that the Comptroller considers the proposed amendments are allowable in respect of s14(5) and s76 of the 1977 Act.

52. The underlining in claim 1 above shows the amendments now sought. The part of claim 1 without underlining is old claim 1 as granted. The underlined portion in step (ii) consists of the material words of old claim 9. The underlined portion in step (iii) consists of the material words of old claims 4 and 5, the underlined portions making up steps (iv) to (xiii) consists of the material words of old claim 2 and new step (xviii) is old claim 12.

53. Thus new claim 1 is a claim which was in fact present in the granted patent. It was old claim 12 insofar as it was dependent on old claims 1, 2, 4, 5 and 9. At one stage it was suggested that this amendment somehow represented a new selection or a combination of elements not disclosed either at all or as having technical significance in the granted patent. I am not sure that argument was maintained by the end of the trial but if it is, I reject it. Precisely the same combination was disclosed and was claimed as an invention in the granted patent. There is no tenable objection to the amendment as compared to the granted patent.

54. By closing the important objection to the amendment was that it added matter as compared to the application for the patent as filed, contrary to s76 (3) (a) of the Patents Act 1977 (cf. Art 123(2) EPC). The Court of Appeal pulled together the general principles relating to added matter in ***European Central Bank v Document Security Systems*** [2008] EWCA Civ 192 at paragraphs 11 and 12, approving Kitchin J's summary in the same case at first instance in paragraph 96 to 102. I will not set it out here.

55. Dr Lawrence prepared a useful chart comparing the text of new claim 1 with the claims of the application as filed. The application for the patent included both product claims and process claims. Since new claim 1 is a process claim it makes sense to compare it to the main process claim in the application (claim 7). Claim 7, the broadest process claim, required the use of a machine "as described above". It may be noted that claim 7 did not say "as claimed in any previous claim" and a reader would understand this as a reference to the specification as a whole and not just to claims 1 to 6 of the application.

56. The steps of the process in claim 7 were the same basic PIM process steps as claim 1 above, that is steps (v) to (viii) and (xiv) to (xvii). Claim 7 did not include the steps relating to the former but they were in claim 8 of the application as filed which was

dependent on claim 7. Thus claim 7 and 8 of the application disclosure all of steps (i), (v) to (viii) and (xiv) to (xvii). What is missing so far are the features of the machine.

57. Claim 1 as filed was the broadest claim in the application which defined a machine. It used the familiar language about mould halves etc. Taking that into account leaves only three points outstanding: pumping the heating and cooling fluid through channels, the reinforcement structure and the insulating jacket. As to pumping the heating and cooling fluid through channels, that is mentioned in claims 10 and 11 of the application.

58. I have broken down the features in this way to show where they come from. However of course the correct approach is to look at the matter as a whole and consider combinations of features as combinations, not as individual features. Bearing that in mind I am quite sure that subject to reinforcing and the insulating jacket, the combination claimed in new claim 1 does not add matter over the application as filed. It was fairly and properly disclosed, as a combination, in the application.

59. The real issue is the reinforcement structure and the insulating jacket. Claim 1 of the application called for a machine with a pair of moulds and included as a feature the presence of an insulating jacket. It did not mention reinforcement. The consistory clause at p2 ln6-7 of the application is to the same effect. Claim 3 as filed required the insulating jacket to be a casing containing insulating material and claim 6 added the feature of using a reinforcement structure to resist buckling and to act as a support for the moulds and insulating jackets. The only reference in the description is at p5 ln26 to p6 ln3. This describes the insulating jacket which each mould is provided with and states that the jackets are provided with a reinforcement structure of ribs and interconnecting beams.

60. New claim 1 requires the presence of the reinforcing ribs but does not require the presence of an insulating jacket. The real objection to this amendment is that it discloses a new combination not disclosed before. That new combination has all the features familiar from the patent (process steps, pair of moulds etc.), but also tells the reader that the device must have reinforcing ribs but need not have an insulating jacket. This, it is said, is new information not disclosed to the skilled reader in the application and not something he could clearly and unambiguously derive from the application without hindsight. Put another way, the application in its broadest claim required the presence of an insulating jacket. The ribs were an optional extra on top but never taught separately.

61. Looked at this way, there appears to be a potentially serious problem of added matter. Mr Howe rightly pointed out that this issue had not be raised in the pleadings at all and appeared for the first time in Dr Lawrence's skeleton argument. Dr Cox had not considered the point. However Mr Howe did not object to it coming in.

62. Mr Howe put the issue of the relationship between the reinforcement structure and the insulating jacket to Dr Cox in the witness box. Dr Cox explained that it had taken him some time to understand figure 4 of the patent but when one looks at it, it can be seen that the insulating jacket can be removed without any change to the reinforcement structure. Figure 4 is:

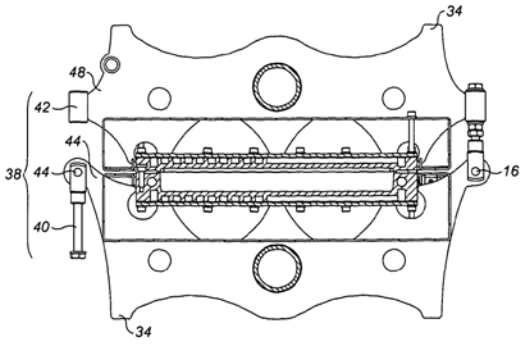


FIG. 4

63. Dr Cox's understanding of figure 4 was not challenged and I believe he is correct. The covers of the insulating jacket are the two rectangular pieces on either side of the moulds. The reinforcing ribs are items 34. They have curved inner surfaces and touch the moulds around the edges and in the centre. In fact once this is recognised, the distinction between the ribs and the jackets can probably also be seen in figure 2 where the rib fits inside a notch and also in figure 5.

64. Bearing this in mind, it seems to me that a skilled reader, taking the application as filed as a whole and in particular bearing in mind what is disclosed by the drawings, is being taught that the insulating jacket and the reinforcement structure are independent structures. It is possible to employ either without the other and it is possible to do so in combination with all the other elements referred to in the claims. Both the reinforcement structure and the insulating jacket are optional features independently disclosed in the application as filed when it is read as a whole bearing in mind the drawings. Although the insulating jacket is mentioned in the broadest claim of the application and the consistory clause, the skilled reader would not see it as indispensible. It is there to be used if required.

65. The claimant submitted that by referring to the reinforcement structure without the insulating jacket, a widening amendment of the kind which arose in ***Protoned's Application*** [1983] FSR 110 had taken place. I disagree because I find that taken as a whole and as I have said, bearing in mind what is disclosed in the drawings, the concept of using the reinforcement structure independently of the insulating jacket is disclosed in the application as filed. The claimant also argued that by restricting the proposed amendment to some but not all of the features of the preferred embodiment, an impermissible intermediate generalisation had taken place. I do not agree because it seems to me that the now claimed features, in combination, were fairly and properly disclosed in the application. It is nothing more than claims 7, 10 and 11 of the application read in the context of the specification as a whole and bearing in mind the reinforcement and an insulating jacket are both independently optional.

66. The combination of features in new claim 1 does not add matter.

Discretion - claim 2

67. The claimant contended that the amendment should be refused on discretionary grounds since it included new claim 2. This is not the most important point in the case and neither side said much about it. Nonetheless it falls to be addressed.

68. New claim 2 (which was claim 13 as granted) is a so called "omnibus" claim. These were formerly quite common. They can be difficult to interpret. Are they very narrow, very broad or somewhere in between? 40 years ago a patentee found the last valid claim standing was the omnibus claim (***Surface Silos v Beal*** [1960] RPC 154). However both the current edition of Terrell (17th Ed, 2011, paragraph 9-123) and its predecessor (16th Ed, 2006, paragraph 6-128) state that the circumstances in ***Surface Silos*** are unlikely to recur in the modern practice and so "it is therefore an unprofitable exercise to attempt to reconcile the many decisions, now of considerable antiquity, as to the scope of such claims, but previous editions of this work have gathered the principal references" [referring to the 15th Ed (2000)].

69. The EPO ordinarily does not grant such claims as a result of their difficulty in interpretation (T 150/82 ***IFF / Claim Categories*** (1984)). It may be noted this decision was in 1984. Such claims are only to be allowed in exceptional circumstances and the EPO places the onus on showing such exceptional circumstances on the patentee. In practice this means these claims have effectively been abolished in the EPO. However the UK IPO still grants such claims.

70. The claimant submits that given that EPO practice is now to be followed in amendment applications as a result of s75(5) of the 1977 Act and, since the patentee has not established or tried to establish any exceptional circumstances, the amendment should be refused as a matter of discretion.

71. I do not agree that this amendment can be refused on discretionary grounds. The reason is because this claim is not being amended at all. To renumber it does not count. For what it is worth I think the EPO, despite their antipathy to these omnibus claims, would take the same view. The patent has been granted with that claim in it. If the claim is invalid it should be revoked, but there is no reason to refuse an amendment which makes no change to it.

72. I will allow the amendment.

73. If I may say so, the UK IPO might like to consider whether omnibus claims serve any useful purpose today save in exceptional circumstances. I question whether they can really be said to satisfy the requirement of clarity (s14 of the 1977 Act) which is applicable pre-grant but is not a ground for post-grant revocation.

Obviousness

74. Section 3 of the Patents Act 1977 Act provides that an invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art having regard to any matter which forms part of the state of the art by virtue of s2(2) of the 1977 Act. A structured approach to the assessment of obviousness was set out by the Court of Appeal in ***Windsurfing International Inc v Tabur Marine*** [1985] RPC 59 and was adjusted somewhat by Jacob LJ in ***Pozzoli v BDMO*** [2007] EWCA Civ 588, [2007] FSR 37. It is:

> (1) (a) Identify the notional person skilled in the art;
>
> (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, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

75. A passage from the judgment of Kitchin J in ***Generics (UK) Ltd v. H Lundbeck A/S*** [2007] RPC 32, paragraph 72 which deals with the consideration of obviousness itself was approved by the House of Lords in ***Conor v Angiotech*** [2008] RPC 28, [2008] UKHL 49 at paragraph 42. That passage is:

> "The question of obviousness must be considered on the facts of each case. The court must consider the weight to be attached to any particular factor in the light of all the relevant circumstances. These may include such matters as the motive to find a solution to the problem the patent addresses, the number and extent of the possible avenues of research, the effort involved in pursuing them and the expectation of success."

76. The defendant contends that the relevant prior art lacks more than one feature claimed in claim 1. The claimant submitted that the additional features are both individually and collectively obvious modifications and do not give rise to an inventive step, comprising a mere workshop variation, a mere collocation and/or a mere arbitrary selection in respect of which there is no technical contribution.

77. Dr Lawrence pointed out that the public are entitled to make obvious products using obvious and ordinary techniques (***Abbott Laboratories v Evysio*** [2008] RPC 23 at paragraph 181) and that a skilled person should be assured that his actions will not be covered by any monopoly granted to another if he does that which is part of the state of the art with modifications which are workshop modifications or otherwise technically or practically obvious alterations (***Hallen v Brabantia (UK) Ltd*** [1989] RPC 307 at 327; [1991] RPC 195 CA). Mr Howe did not disagree and I accept both points.

78. Dr Lawrence also submitted that a mere placing side by side of old integers so that each performs its own proper function independently of any of the others is not a patentable combination and for this cited ***British Celanese Ltd v Courtaulds Ltd*** (1935) 52 RPC 171 at 193 (HL) and ***Sabaf SpA v MFI Furniture Centres*** [2005] RPC 10 HL. As a proposition of law Mr Howe did not disagree and I accept that point as well.

79. However the defendant contended that on the facts of this case the two key missing features were not independent of each other. There was an interplay between the two features and therefore the legal principle explained in ***Sabaf*** did not apply. For claim 1 to be obvious a process which had both features together in combination had to be

obvious. The claimant denies the existence of any "synergistic interplay" between the features as a matter of fact but also contended that even if such an interplay existed, the defendant could not rely on it because it was not identified in the patent. A further point was that the claimant argued that this argument meant the original claim 1 as granted was ***Biogen*** insufficient but I do not need to get into that since the validity of claim 1 as granted is not in issue.

80. On the need to identify the synergistic interplay in the patent, Dr Lawrence cited the judgments of Pumfrey J as he then was in ***Glaxo Group's Patent*** [2004] RPC 43 paragraph 114; Jacob J as he then was in ***Richardson Vicks Inc.'s Patent*** [1995] RPC 568; and Kitchin J as he then was in ***Generics v Lundbeck*** [2007] RPC 32 paragraph 237 (reversed on other grounds in higher courts). These judgments explain that unexpected bonus effects cannot be relied on, that if synergy is relied on it must be possessed by everything in the claim, that if synergy is relied on it must be described in the specification, and that a patentee cannot rely on a discovery he had not made at the time to bolster the inventive nature of his monopoly.

81. Mr Howe did not disagree with the first, second or fourth point but he took issue with the third (description in the specification). He said that the cases in which the point arose were all chemical/pharmaceutical cases. In a case in which there are two drugs and the patent claims them in combination but does not mention any synergy or interplay between then, one can understand why the court will not accept an argument based on synergy if the patent does not mention the synergy. If the two drugs were individually known or at least obvious and the invention lies in putting them together then usually the only thing which could make it inventive would be the fact they interact in some way to provide a benefit. If in such a case, the patent did not describe that unexpected interaction then the real invention is not in the patent at all. Mr Howe contended that one needed to take care in translating that logic, which he accepted was sound, into a case about a mechanical invention like this one. Mr Howe submitted there was no requirement that a patent specification should be turned into a tome in which the inter-relationship between each of the parts has to be explained in great detail and he submitted that if the skilled reader can see, on reading the specification, how features which have been brought together in the patent will work together, then there is no law that this has to be spelled out in words on the face of the specification.

82. In my judgment there is less between Mr Howe's submission and the third point arising from ***Glaxo***, ***Richardson Vicks Inc.'s Patent***, and ***Generics v Lundbeck*** than might appear. If as a matter of fact a skilled reader of the specification sees what the interrelationship between parts or features described is then that interrelationship has been disclosed. However the fact that two features may have relationship which although unstated, is itself obvious, will have to be kept in mind when considering the prior art. On the other hand if, on reading the patent, it is not apparent what the relationship between two features is, then it seems to me the case falls into the territory of the ***Glaxo*** etc. cases. There is no legal principle which distinguishes between pharmaceutical and mechanical patents.

Application to the facts

83. The person skilled in the art, and the common general knowledge, have been identified above. As regards the inventive concept, this is not a case in which a pithy

paraphrase of the inventive concept can be given. I have construed new claim 1 above.

Identify differences and ask if the invention is obvious

Aylmore

84. The Aylmore application, entitled "Articles incorporating electronic signalling devices" was published in 2006. The real point of Aylmore is the idea of putting an "RFID" inside a plastic article. RFID stands for Radio Frequency Identification Device. These are small electronic signalling devices which are used for electronic tagging e.g. to prevent shop lifting. The proposal in Aylmore is to make an article made of "foamed plastics material" and insert an RFID during manufacture. At p3 ln8-10 Aylmore states that a particularly preferred way of making the article is to make the body using a powder impression moulding process of the type set out in the Dinello application.

85. In Figures 1 and 2 of Aylmore the process for making an article is shown:

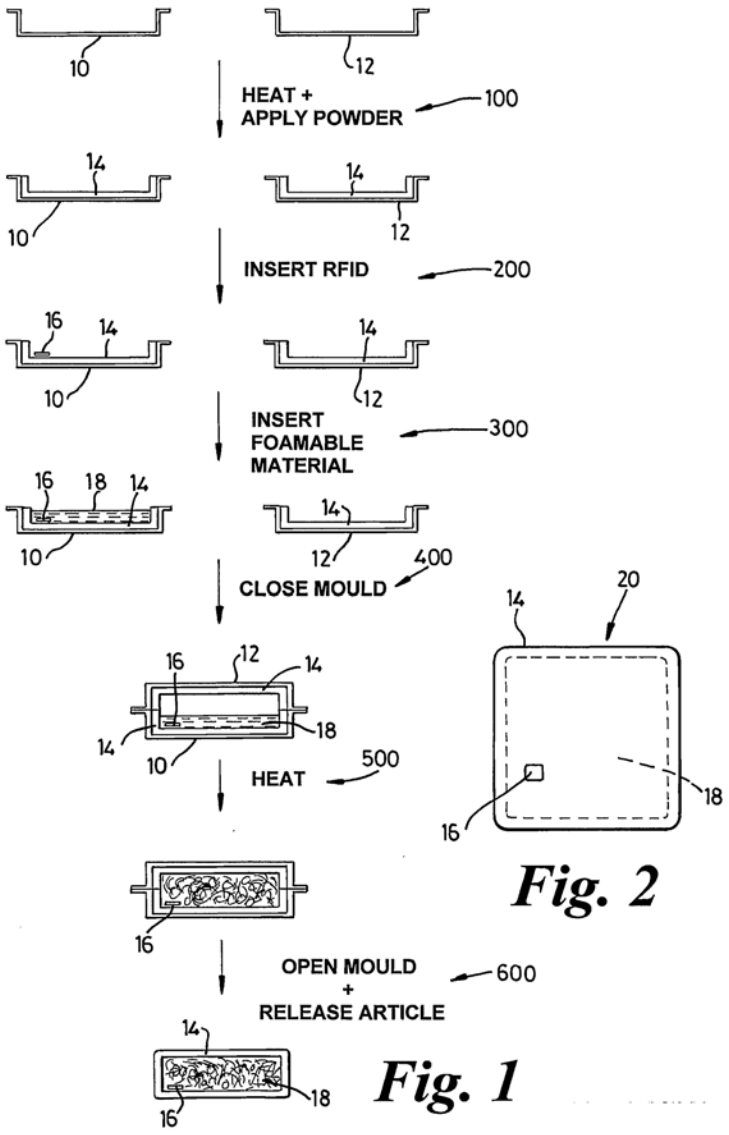


Fig. 2

Fig. 1

86. Complementary moulds 10 and 12 are heated, thermoplastic powder 14 is applied and melts to form a skin. The RFID 16 is inserted. Foamable plastic is loaded into the lower mould on top of the RFID. The foamable material may comprise recycled plastic. The mould is closed by inverting mould 12 and placing it in registration with mould 10. Heat is applied and the foaming agent is activated so that the foamable material expands and fills the cavity. The mould is opened to release the article. Figure 2 shows the finished product.

87. The differences between what is disclosed in Aylmore and claim 1 are:

    i) In Aylmore the moulds are not connected by a hinge (cf claim 1 step (ii));

    ii) In Aylmore the method of heating and cooling is not stated. To be exact there is no mention of active cooling in Aylmore at all. (cf claim 1 step (iii) which requires heating and cooling by pumping fluid in mould channels);

    iii) No former or method of using it is mentioned in Aylmore (cf claim 1 steps (ix) to (xiii));

    iv) No reinforcing structure is mentioned in Aylmore (cf claim 1 steps (xviii)).

88. Although four differences exist, the defendant did not seek to contend in this case that invention lay hinging the two mould halves together nor in doing that in combination with any of the other claimed features. Neither did the defendant place strong emphasis on reinforcing ribs. Dr Cox accepted that a skilled person would likely realise that moulds may distort or buckle under pressure and one possible solution would be to use ribs, although in some cases the ribs might be undesirable since they could acts as heat sinks.

89. The focus of the case was and was only about two differences – the heating/cooling fluid in channels and the former process. In this respect the claimant contended that these were independent features as in ***Sabaf***. The defendant contended that there was an interrelationship between these elements which, although not spelled out in words in the specification, would be understood by a skilled reader. The interactions relied on were:

    i) The use of the former requires the skin to be formed in two stages and the use of heating channels in the mould enables temperature to be maintained at a controlled level in a way not possible with conventional heating;

    ii) The use of heating and cooling channels in the mould means that the mould does not have to be moved between separate stations, as does the use of the former to make the side walls, and the combination of these features enables a ‘one stop shop’ operation where there is no need to use cranes conveyors etc to move the mould;

    iii) The use of these channels assists in the problems of even heat distribution caused by the use of external reinforcement ribs;

iv) The use of separate heating/cooling channels in the mould allows differential temperature control which helps with the two-stage formation the plastic skin with the aid of the former.

90. Point (iv) cannot assist the defendant since it is not co-extensive with the claim. It is true that the patent describes the possibility of moulds with separate dedicated channels. As Dr Cox pointed out, one could heat or cool the side walls separately from the base and help with the two stage skin forming process which uses the former. However although the claim would cover such a process it also covers a process using a mould without such dedicated channels. For a claim to satisfy the law, it must not be obvious across its whole width. Putting the matter another way if point (iv) can be described as synergy, it is irrelevant because it is not possessed by everything in the claim.

91. I will address the interactions below after I have dealt with the features separately, recognising that I need to consider the obviousness of claim 1 as a whole.

Heating and cooling channels

92. Mr Williamson's view was that using heating and cooling channels with fluid was obvious. This was for two key reasons. First it is described in Dinello, the very reference to which Aylmore directs the reader. Second in his view such a technique was obvious in any event. It was part of the common general knowledge. Dr Cox did not agree they were obvious. He did not accept that using heating channels within a mould to melt plastic was part of the common general knowledge. He did not accept they were obvious bearing in mind Dinello because Dinello refers to a number of heating methods and the skilled person would select one well known to him from his common general knowledge such as infrared heaters, electronic heating filaments (cartridges), gas burners or an oven.

93. It was common ground that on the facts of this case the skilled reader of Aylmore would read Dinello. Mr Howe emphasised that in doing so it needs to be remembered that the reader is reading Dinello in the context of starting from Aylmore. I agree.

94. The skilled reader of Aylmore will read Dinello in order to find out more about the powder impression moulding process Aylmore is teaching him to use. One point to note is that Aylmore has stated that the moulds need to be heated but has not said how. I doubt a skilled person would simply read Dinello in order to hunt for heating methods but it is nevertheless a particular point which any reader of Aylmore who goes on to Dinello will be alive to.

95. The summary of the invention disclosed in Dinello is at p6 of the document. It is a "new method for forming plastic into either a single skin configuration or a multiple skin configuration, usually two skins, which may also have contained therebetween either an expandable plastic material, reinforcements for strengthening the plastic article, other filler materials, or combinations thereof."

96. The main processes and articles described in Dinello can be summarised by reference to the figures with their associated text:

i) an "open mould" process - figure 1a-1c;

ii) a double skinned structure - fig 2a-2b;

iii) a method of making a double skinned article with male and female moulds - fig 3a-3c;

iv) a method of making an article consisting of varying materials – fig 4

v) the basic process for making a pick up truck bed box - fig 5 (and figs 6 to 11);

vi) a test tool for the truck bed - fig 12 to 18; and

vii) various articles which might be made - figs 19 to 23.

97. Dinello describes a PIM process in various ways. The open mould process involves a single mould piece placed into a container of plastic particles which then melt on the mould and form a skin. The double skin process involves forming skins on the inner faces of two moulds and putting expandable plastic in between. The reader of Dinello who was following up the reference from Aylmore would recognise the double skin process in Dinello as the process used in Aylmore. A distinction is that in Dinello the two mould halves are a male and female form whereas in Aylmore the two mould halves are in effect two female moulds. To that extent Aymore represents a variant of the double skinned process but a skilled person would see the plain relationship between the two methods and would expect to find out details of how to put the Aylmore process into practice by reading Dinello.

98. That is a sufficient summary of Dinello's disclosure in order to address the case and given the issue I have to decide I will now focus on what Dinello teaches about heating and cooling the moulds. I do this bearing in mind that the skilled reader would read Dinello as a whole and with an open mind. I do not think it is a simple as saying the skilled person would read Dinello in order to find out how to heat or cool the moulds used in Aylmore, although as I mentioned already, Aylmore is unspecific about heating and cooling methods. I will also take account of the fact that Dr Cox did not notice the references to heating lines in Dinello when he first read it in this case although at that time it is fair to say that Dr Cox had been rather more focussed on an item of prior art called Wiper which is no longer relied on than he was on Aylmore. The moulds in Wiper were thin and heating and cooling lines would probably not have been feasible in Wiper.

99. The parts of Dinello which refer to figs 1 to 4 are headed "II. General Article Construction". In the first paragraph (p13 ln31-p14 ln9) Dinello teaches that the mould has to be heated above the melting point of the plastic and can be purposely cooled or allowed to cool. Heating and cooling lines are expressly referred to at line 6-7. Heater lines are again mentioned in this context at line 18-20 on the same page. The heater lines may conduct hot water, oil or gas. Other methods of heating are mentioned after that including heating in an oven, heater torches, direct flames, infra-red, microwave or radio frequency energy, plasma or thermoelectric devices (i.e. cartridges). Mr Howe emphasised that this section related to the single skin mould process of fig 1a-1c.

100. In the paragraph bridging p18 –p19 at p19 ln1, Dinello again mentions heater lines being incorporated into the mould. This is still in section II. "General Article Construction" but now relates to fig.4.

101. The next section of Dinello is "III. Various Process Embodiments". This relates to fig 5 onwards. In the paragraph bridging p19 –p20 Dinello refers to heating the two moulds in fig 5. The two moulds are a male and a female mould. The methods of heating mentioned are oven, torches or lines containing hot water, oil or gas. At p21 there is a discussion of the test tool shown in fig 12. This tool has cartridge heaters in the top part and water lines for cooling in the lower part. Finally at the end of Section III at p26 ln6 Dinello refers to cooling the heated moulds in various ways including using heating/cooling lines within the mould itself and other ways such as moving the entire assembly into a fridge.

102. Dr Cox was concerned that some of the text in Dinello would be understood to be plainly wrong by a skilled reader such as a reference to certain temperatures. I accept that but I do not think it would detract in a material way from the skilled person's understanding of Dinello.

103. The person skilled in the art is a legal construct. Although Dr Cox did not notice the reference to heating lines in Dinello when he first read it, in my judgment the person skilled in the art who read Aylmore and then Dinello would see a clear teaching that heating and cooling lines in the moulds and carrying fluid were a suitable technique to use. It is true that each reference to them in Dinello is in its own context but overall, the document is clear that this approach is one way of heating and cooling the moulds in the general processes being described. It did not require an inventive step for a skilled person to decide to use heating and cooling lines to heat and cool the moulds in the process disclosed by Aylmore. No hindsight is involved. That element of claim 1 would be obvious even if a skilled person had never encountered lines in a plastic mould which could be used to heat and cool a mould.

104. The obviousness of heating and cooling lines in this process is reinforced by the fact that although they were not actually used to melt the plastic, the skilled person would be familiar with heating and cooling lines in a plastics mould in injection moulding. After all injection moulding is and was the most well known plastics moulding technique.

105. At this point it is necessary to deal with the relationship between reinforcing ribs and heating channels. The point is that the ribs can act as a kind of heat sink and would interfere with attempts to heat the mould by applying heat externally as in an oven, whereas the internally applied heat from the channels avoids this difficulty. Mr Williamson accepted that if you are heating the mould externally in an oven, the reinforcing ribs would interfere to some extent with the imperative to bring the whole mould up to the desired temperature but he did not regard it as a major problem. One would simply heat it in the oven until the whole mould is hot.

106. I doubt this is a factor of any real significance but even if it is, I do not accept it turns the idea of having a mould with both reinforcing ribs and heating channels, each of which would be obvious in their own right, into the product of an inventive step. Ribs are obvious for reinforcing and heating channels are obvious for heating. They are

obvious to use together. The fact that channels may be a slightly better way of heating a mould with ribs than an oven does not make the combination inventive.

107. The position I have reached thus far is that I have considered all that needs to be considered to deal with all of the features of claim 1 save for the steps relating to the former. In other words all bar steps (ix) to (xiii). While again remind myself that, subject to ***Sabaf***, the claim as a whole is what needs to be considered, it is convenient to pause and draw breath at this stage. In my judgment the process claimed in claim 1, leaving aside the steps relating to the former, is obvious over Aylmore. No invention lies in using, in the same PIM process, a mould with hinges, reinforcing ribs and channels for heating and cooling fluid.

Former

108. Nowhere in the prior art was the claimant able to point to a disclosure of a series of steps corresponding to steps (ix) to (xiii). They are not in the prior art and do not form part of the common general knowledge.

109. Mr Williamson explained that anyone skilled in the art would know about the use of a former to block off part of a mould to stop plastic reaching a particular area. I accept this evidence. An example can be seen in the Contour process in which a plug is used to make sure the moulded article (a shower tray) has a hole in it for the drain. But as Mr Williamson accepted, this is not the way the former is used in claim 1.

110. Mr Williamson exhibited a sheet which showed that an item called a "former" was used in the concrete trade to make a space for sealant in a concrete joint but there was no suggestion the skilled person would be aware of that. It is irrelevant. There was also some evidence that a "former" was used as part of the process of sand casting in an iron foundry but it is also irrelevant.

111. The point of the use of the former in claim 1 is to facilitate the formation of the side walls. Dr Cox's view was that the role of the former in this method was not simply to block off a part of the mould (as was commonly done and Mr Williamson had described) but to force particulate to press up against the side wall of the mould so that the skin can be formed there. Dr Cox had never heard of that use of such a former before. I accept his evidence on these points.

112. The views of the experts on the process of using a former called for in claim 1 were very far apart. Mr Howe put the process of forming the side walls with the former to Mr Williamson in cross-examination. Mr Williamson's view was clear and was stark. The process of using the former was "a nonsense". It was an unsatisfactory answer to a problem which did not exist.

113. Mr Williamson's view was that to form the walls and the base one would simply fill the mould completely with the particulate. It would melt on the walls and on the base and form a skin and the excess particulate would then be tipped out, leaving walls and a base. If, which he did not accept, there was any problem forming the wall in this process then you could rock the mould or perhaps (as Dr Cox described) use a pre-made plastic part for the walls although that would be fiddly. As he put it later, using a former in the manner claimed was a crazy way of solving a non-existent problem. He thought it was just stupid.

114. When asked whether a skilled person would think of doing this in the light of Aylmore and Dinello, Mr Williamson's view was that there would be no need for it and the skilled person would therefore not think about it.

115. Dr Cox's position was different. The way in which he had been instructed meant that Dr Cox first was asked to consider the common general knowledge without reference to the cited prior art or the patent. Then he considered the prior art, again without reference to the patent or knowing anything about it. After that he was given the patent. His expert evidence in chief consisted of two reports, the first one dealing with common general knowledge and the prior art but written without reference to or knowledge of the patent and the second dealing with the patent.

116. In his first report Dr Cox thought that the prior art method of making side wall skins within the mould in a PIM process would give rise to problems. In fact he was focussing on Wiper but in this context that does not matter. There might be a tendency for molten plastic to slide down the walls under gravity and pool at the base of the mould. The skins formed could be messy and uneven and thicker at the bottom of the wall than at the top. He suggested a number of solutions that would occur to the skilled person (such as the pre-made plastic part). Using a former to assist in making the side walls did not occur to Dr Cox and in his later report he expressed his opinion that it was not obvious.

117. It was suggested to Dr Cox that the use of plug (such as was used in the Contour process – see below) was conceptually similar to the claimed former process. He did not agree. He said "it is a function which I will not say is unique …" by which I understood him to stop before the unspoken "but". In any event I do not accept that the process of using the former in claim 1 is, in any relevant sense, conceptually similar to the very well known techniques of blocking off parts of moulds for plastics. They both involve placing objects in the mould which stop plastic going into a particular region but the claimed method is much more specific than that and there is no evidence anything like it has been done before.

118. It was suggested to Dr Cox that if the lower mould to be used was a fairly deep mould, then an obvious thing to do would be to use a former to block off the bulk of the space so that one would not have to fill it with material. Dr Cox did not agree since it would be very difficult for the plastic particles to flow to the centre of the tray in order to make the bottom skin. In other words it was not obvious because the plastic particles would have to get underneath this former in order to make the base of the article. He did think that a different process, in which one filled up part of the mould with plastic, then put in the former, and then filled up the rest, might occur to a skilled person. It would save on plastic material. But it is not the process claimed in claim 1.

119. The issue of obviousness relating to the former in this case turns on whether it really is a genuine solution to a genuine problem. Mr Williamson's trenchant view was that it was not and Dr Lawrence emphasised that something which adds nothing to the art cannot comprise an inventive step. Perhaps the reason that existing plastics moulding techniques do not use a former process like the one in claim 1 is because it is truly a nonsense.

120. I was shown a later patent application by the defendant which relates to an applicator device for a plastic moulding machine. The first page of the specification describes the problem to be solved. The problem is that the procedure using the former described in the patent in suit in this case is "complicated, cumbersome and slow". I was also told by Dr Lawrence that the defendant does not use the former process (at least at present).

121. In my judgment the method of using a former as set out in claim 1 is addressed to genuine potential difficulties in the PIM process which relate to the step of making the walls. The use of a former in the manner claimed provides a solution to those problems. The fact that a later patent application describes that solution as complicated, cumbersome and slow does not mean it is not a solution. Indeed the later patent application, if anything, supports the view that there is a real problem to be addressed.

122. I have no doubt about the genuineness of Mr Williamson's views about the former but I prefer the evidence of Dr Cox on this issue. He identified a difficulty relating to forming the walls in his first report. I think there is a real problem to be solved here and in my judgment the use of a former in the manner claimed is a way of addressing that problem which was not obvious.

123. I hold that claim 1 is not obvious over Aylmore, read with Dinello.

124. It is not necessary to consider the arguments about the interactions between the former and the heating and cooling channels since I find that the steps concerning the former are not obvious on their own merits. I will simply say that I am far from convinced that either of the two relevant alleged interactions would have made any difference if I had gone the other way on the issue of obviousness of the former. I think point (i), that the improved temperature control would help in the former process, would itself have been obvious to a skilled person. I think if a skilled person had thought of the former process, they would have naturally looked to use a heating and cooling system like the channels as a way of controlling temperature. I think point (ii) is of no substantial weight. The heating and cooling channels do facilitate a "one stop shop". To the extent that there is an interplay with the former process, it is minor and does not turn the combination of channels and a former in PIM into an invention.

Contour

125. Given what I have found was made available to the public by the Contour prior use, it does not add anything of substance to the argument over Aylmore. If anything it is a weaker point because Contour involves the apparently successful use of a heating technique based on an oven whereas Dinello expressly teaches a range of options including heating and cooling channels. As for the issue of the former process, Contour does include a plug (unlike Aylmore) but using such plugs in this general way was part of the common general knowledge and I took that into account in the argument over Aylmore. There is no better hint or pointer to the former process in the argument over Contour than there is in the argument over Aylmore.

126. I am sure that if claim 1 is not obvious over Aylmore, it is not obvious over the Contour process.

Conclusion

127. I will allow the amendments to the patent. The patent is valid as amended.