IN THE SUPREME COURT OF JUDICATURE—COURT OF APPEAL

Before LORD JUSTICE WILLMER

LORD JUSTICE DIPLOCK AND

LORD JUSTICE RUSSELL

31st May, 1st and 5th June, 1967.

JOHNS-MANVILLE CORPORATION'S PATENT

Patent—Belated opposition—Obviousness—Person skilled in art would consider process worthy of trial—Invention held clearly obvious—Evidence on appeals.

In an application for revocation of a patent the alleged inventive step of which resided in the application of a recently introduced flocculating agent in the known process of cement asbestos manufacture, the applicants for revocation alleged obviousness in respect of two prior published documents which disclosed the use of the flocculating agents in other industries including the paper industry. They also relied on the evidence of their technical manager who stated that someone outside the industry had suggested to him before the publication of the cited documents that the flocculating agents might be useful in his process, and that he had tried them and found that though the filtration rate was improved, and the thickness of the layers of the cement asbestos picked up increased, in common with his experience with hitherto known flocculating agents, these flocculating agents had an adverse effect on the quality of the end product. Consequently he had not considered them as advantageous in the cement asbestos manufacturing process. After the priority date of the specification he was told that they were found to be advantageous, and he then found that by making an obvious adjustment to the speed of the machine to reduce the thickness of the cement asbestos layers, the hitherto experienced deleterious effect on quality could be overcome. The patentees contended that in the light of the admission by the technical expert of the applicants for revocation that at the relevant date he regarded the use of these flocculating agents as disadvantageous, it was not proved that it was clearly obvious to use them in the process of cement asbestos manufacture. The Patent Office revoked the patent, and this decision was upheld by the Patents Appeal Tribunal. On appeal by the patentees to the Court of Appeal :—

Held, (1) *that it was sufficient to invalidate a patent on the ground that the alleged invention was " obvious and clearly did not involve any inventive step " if it could be proved, as it was here, that the person versed in the art would assess the likelihood of success sufficient to warrant trial, and therefore the appeal would be dismissed* (*p.* 494).

(2) *That regarding the patentees' argument based on the evidence of the technical expert, he found that it was increase of thickness which was responsible for the adverse effect on quality, and it was conceded by the patentees that an obvious*

adjustment was all that was needed to overcome this difficulty. This merely showed that this witness's glimpse of the obvious was spasmodic, and to that extent he was atypical of the hypothetical person versed in the art of cement asbestos manufacture. There was nothing in this evidence to throw doubt on the conclusions reached by the Patent Office and Patents Appeal Tribunal that the idea of using the flocculating agents in cement asbestos manufacture was obvious having regard to the information published in the two cited documents (p. 495).

(3) *That it would need a very strong case indeed to justify this non-expert court in interfering with the concurrent findings below on what was basically a jury question* (p. 496).

(4) *That technical instruction for the court, if required on appeal, should preferably taken the form of a statement agreed between the parties* (p. 492).

This was an appeal to the Court of Appeal from a decision of the Patents Appeal Tribunal upholding the revocation by the Patent Office of patent number 887,997 belonging to Johns-Manville Corporation, of Manville, New Jersey, U.S.A., as a result of revocation proceedings brought under section 33 of the Patents Act by Turners Asbestos Cement Company Limited. To supplement the judgment of the Court of Appeal there are reproduced below the main declaration by the applicants for revocation in support of their application, and the decisions of the Patent Office and Patents Appeal Tribunal.

The declaration by Walter Watson dated 20th December 1963 is set out below.

1. I am the manager of the research department of the applicants for revocation and have held this position for 11 years, having been in the department for the 10 preceding years. I have very considerable knowledge of the manufacture of asbestos-cement.

2. The applicants, who I will call T.A.C., are the largest producers in the United Kingdom of asbestos-cement sheets and pipes, including pressure pipes.

3. I have read copies of the papers in these proceedings.

4. In the most common method of making asbestos-cement products, originally invented by Hatschek, a moving felt is passed over a cylindrical sieve which dips into a vat of asbestos-cement slurry and carries the slurry upwards into contact with the underside of the felt, on to which it is transferred. The felt is then passed over a suction box and thereafter pressed against a rotary cylinder so as to transfer the asbestos and cement layer on it to the cylinder. If a sheet is to be formed, a cut is made through the coating parallel to the axis and the coating is removed as a sheet while the cylinder continues to rotate. Machines in which sheets are so made are known as Hatschek sheeting machines. If a pipe is to be formed, the machine is modified in that the cylinder is replaced by a mandrel, and pressure rolls are provided to bear against the coating on the mandrel and consolidate the coating to a greater extent than in a Hatschek sheeting machine. When the coating has been formed, the coated mandrel is taken out of the machine and the mandrel is then removed axially from the coating to leave a pipe. Machines working on this principle are known by the name of Mazza, and the process described in detail in example III of specification No. 887,997 is a Mazza process.

5. Another method of making asbestos-cement pipes is known by the name of Magnani. A Magnani pipe machine comprises a hollow mandrel closely perforated with fine holes and covered with stockinette. This rotates between two horizontal

rollers, and is also provided with a connection to a vacuum pump. A thick asbestos-cement slurry (about 20% solids) is poured into the nip between the roller and the mandrel, and as the mandrel rotates a thick layer is built up on it under the influence of the internal vacuum and the external pressure of the rolls. End plates prevent loss of slurry from the ends of the rolls. The pipe is built up by backing off the pressure rolls whilst adding fresh slurry until the required wall thickness has been obtained. The pipe on the mandrel is then removed from the rollers and the mandrel is drawn out of the freshly formed asbestos cement pipe, leaving the stockinette adhering to the bore. The mandrel is covered with clean stockinette and returned to the machine, whilst the dirty stockinette is stripped from the pipe bore and a plastic core is inserted to preserve the shape of the pipe whilst the cement sets.

6. In the Hatschek and Mazza processes the dilution of the slurry is much greater than in the Magnani process, and the slurry must be deprived of much of its water if it is to adhere to the felt. The sieve acts as a filter as well as an upward conveyor. The water content of each layer transferred to the cylinder or mandrel must be controlled, and therefore more water is removed from the laminae as the felt passes over the suction box.

7. For many years there has been continuous pressure on me and my department to provide means for increasing the output of the machines. The making machine is associated with other machinery for handling and removing the product, and the whole assembly is constructed to run at a given output, which corresponds to the practical maximum speed of the slowest element in the assembly. Obvious variables in increasing output are the type and speed of the machine, the concentration of the slurry and its filterability. It is, however, useless to increase output at the expense of quality of the product. Quality is particularly important in the production of pressure pipes.

8. It has for many years been abundantly clear that if the speed of separation of the water from the solids could be increased more asbestos and cement could be picked up. The art of separating water from solids with the use of a flocculating agent is of course well understood. In separating water from asbestos-cement a flocculating agent can be used only if it does no harm to the resultant asbestos-cement product. It was at all times obvious to me that if a flocculating agent that was not detrimental to asbestos-cement or to the setting of this could be found it would be of great advantage. Up to 1956 I knew of no such agent.

9. I have no doubt that the patentees' experience in attempting to speed up their output was substantially the same as that of T.A.C. and that they also considered flocculating agents.

10. T.A.C. are a subsidiary company of Turner & Newall Limited, and another such company is The Washington Chemical Company Limited. To co-ordinate research in the various subsidiary companies and facilitate the exchange of technical information, a liaison committee that includes the managers of the various research departments meets periodically. In addition each manager visits the works of the other companies from time to time. In the spring of 1956 Mr. T. L. Forsyth, the manager of the research department of The Washington Chemical Co. Ltd., visited the works of T.A.C. at Trafford Park and told me that he was experimenting with ACCOSTRENGTH resin as a flocculating agent. I was at once interested in its possible use in speeding up the production of asbestos-cement, and after trying in vain to buy it I wrote to Mr. Forsyth on April 3rd 1956 on the subject, and I now produce a copy of my letter together with a reply I received and mark these WW1. Shortly afterwards there was a meeting of the liaison committee, when I again discussed

the question of filtration with Mr. Forsyth and learnt from him of another flocculating agent, namely Polyacrylamide 75 resin. I subsequently wrote to him about this and received a reply and I now produce a copy of my letter and the reply and mark them WW2.

11. In 1956 Turner and Newall also had an American subsidiary company, namely Keasbey & Mattison Company, who were engaged, inter alia, in the manufacture of asbestos-cement. In the summer of 1956 Mr. C. R. Hutchcroft of this company visited T.A.C. and told me that he was intending to try AEROFLOC 552 as a flocculating agent to give increased rate of production of asbestos-cement. I subsequently received from him a copy of a memorandum he addressed to Mr. Muehleck, the president of Keasbey & Mattison, on this subject, and I now produce this copy and mark it WW3.

12. The three flocculating agents which were thus brought to my notice are all polymers of acrylamide as called for by claim 3 of patent No. 887,997.

13. Later in 1956 I obtained some Polyacrylamide 75 from Cyanamid of Great Britain Ltd., who I believe to be a subsidiary company of American Cyanamid Company. Subsequently I was regularly supplied with technical literature on flocculating agents by Cyanamid of Great Britain Limited, and this included the two papers entitled " Polyacrylamide " and " Aerofloc reagents " which are cited in the present application for revocation, both of which I received in 1957. There is no doubt at all that, if I had not already been led to consider the reagents described in these two papers, I should on reading them have seen that I ought to determine whether the reagents described in them would be of value in the manufacture of asbestos-cement.

14. Under my supervision laboratory experiments were carried out with additions of AEROFLOC 552 (in 1956) and with addition of ACCOSTRENGTH 2386 (in 1957) to mixtures of asbestos and water, to mixtures of cement and water, and to mixtures of asbestos, cement and water. These experiments showed that a product of given thickness was obtained with fewer laminations, and therefore in a shorter time, but that the quality was worse. This decrease in quality coupled with the extra cost involved in the use of the flocculating agents caused me to take the matter no further in 1957.

15. In 1960 I learnt from Keasby & Mattison of other flocculating agents, namely SEPARAN NP10, SEPARAN AP30 and SEPARAN 2610, all of which are polyacrylamides, and was informed that these were being used with success. This encouraged me to make further trials, and in 1960 SEPARAN 2610 was used in a Mazza machine. The limiting factor in the speed of this machine was the felt speed, which was already at the maximum at which the driving motor would run the felt. Though increase in output was obtained by the use of the SEPARAN, the strength of the pipes suffered.

16. Later in 1960 SEPARAN was used in a Hatschek sheeting machine which happened not to be running at the maximum practical speed. It was suggested that the speed of this machine should be increased, and directly this was done the desired increase in output was obtained without loss of quality.

17. In a Magnani process the layer on the mandrel is not built up in laminations, so the loss of quality resulting from increased lamination thickness does not arise. In April 1960 0.01% SEPARAN NP10 was used in the mix on a Magnani pipe machine and resulted in 20% increased output with no loss of pipe quality. The SEPARAN has been used continuously since then in this machine.

18. So far as the quantity of the flocculating agent to be added is concerned we were directly guided in our experiments by the information supplied to us, and in particular by "Aerofloc Reagents," which says:

> "In most applications the amount of AEROFLOC reagent required is of the order of only a few hundredths of a pound of AEROFLOC reagent per ton of dry solids in suspension. In very dilute suspensions, from 0.1 to 10 parts per million of AEROFLOC reagent are usually effective. In some instances, quantities as high as 0.1 to 0.5 pounds per ton may be required to give satisfactory flocculation."

An American ton being 2,000 lbs., 0.1 to 0.5 lbs. per ton of dry solids is 0.005 to 0.025%. We found about 0.006% to 0.01% satisfactory.

19. From all the work done, as described above, I am satisfied that success can be obtained, but only obtained, by using SEPARAN or other flocculating agent, either in a Magnani machine, or in a Hatschek or Mazza machine in which the felt speed is increased so that there is no increase in the thickness of each lamination. This information, which is the key to success, is not contained in specification No. 887,997, as I can find no word in it about a Magnani process or about the need to increase the felt speed in a Mazza process.

Before the Patent Office and Patents Appeal Tribunal *Guy Aldous*, Q.C., instructed by *Stevens, Langner, Parry & Rollinson*, appeared for the patentees. *P. Stuart Bevan*, instructed by *Gill, Jennings & Every*, appeared for the applicants for revocation. The decision of the superintending examiner, Mr. J. E. Mirams, dated 12th August, 1965, is set out below.

Mr. Mirams—Revocation of the patent is sought on the ground only that the invention claimed in each and every claim of the complete specification was at the priority date thereof obvious and clearly did not involve any inventive step having regard to the publication in the United Kingdom of an article by A. M. Swift first published in Tappi, Volume 40, Number 9, September 1957, entitled "Polyacrylamide—a new, synthetic, water-soluble gum" and a pamphlet published by American Cyanamide Company entitled "Aerofloc Reagents."

The invention relates to a process of producing shaped asbestos-cement articles, particularly pipes and boards. Such articles are formed by the filtration of aqueous slurries comprising asbestos fibres and hydraulic cement (e.g. Portland cement) dispersed in water. In a method described in the specification as being established and extensively used, the formed slurry is flowed on to a filter element upon which the dispersed solids of the slurry may be collected, water in the slurry is removed through the filter element by filtration, and then the formed mass of asbestos fibres and cement is removed from the filter element. Two disadvantages are referred to in the specification which are characteristic of this method, the first of which consists in a rapid decrease in the rate of filtration arising from inhibition of the filtering by the asbestos fibres and finely divided cement particles, making it impractical to form structures of any great thickness with a rate of throughput which must be obtained in commercial operations, and the second of which consists of product losses arising from the passage of unfiltered particulate solids, generally referred to as "fines", into the filtrate. The specification suggests alleviation of the first of these disadvantages (a) by the use of relatively more expensive types of asbestos fibre, or (b) by the addition of small amounts of modifying agents, e.g. certain organic sulphates or sulphonates, to the dispersion of asbestos fibres and cement prior to filtration of the dispersion, and reference is made to the possible disadvantages procedure (b) might have regarding the quality of the products.

The patentees' invention consists of such a filtration process in which there is used as modifying agent a polymer of acrylamide or methacrylamide which may be substituted at the nitrogen atom of the amide group. The patentees' claim 1 reads as follows :—

(1) A process of producing shaped asbestos cement articles by filtration of an aqueous slurry comprising asbestos fibres and hydraulic cement dispersed in water characterized by adding to said slurry prior to its filtration between about 0.005 and 0.2% by weight based upon the dry weight of the dispersed solids in said slurry, of a water-soluble, high molecular weight polymer of an amide of the formula :

$$CH_2=CR_1-CONR_2R_3$$

wherein R_1 is hydrogen or a methyl radical, and R_2 and R_3 are hydrogen, an alkyl radical containing from one to four carbon atoms, or a hydroxyalkyl radical containing from one to four carbon atoms.

Subsidiary claims relate to the use of acrylamide in particular, and to the use of certain proportions of the polymer within the range quoted in claim 1.

The pamphlet entitled "Aerofloc Reagents" opens by stating that these reagents are high molecular weight, water-soluble synthetic polymers which are extremely effective in flocculating finely-divided solids in aqueous suspensions, thereby improving thickening operations and filtration rates. The reagents are identified chemically as polyacrylamides and are stated to have found a wide application for flocculation of suspensions of ore, mineral and metal particles, sewage, industrial wastes and chemical precipitates. The pamphlet goes on to state that they are usually fed as very dilute solutions, causing the formation of flocs or agglomerates made up of many small particles, and that such flocs settle and filter much more rapidly than do the dispersed particles, leaving a clarified supernatant liquor suitable for recycling and discarding without creating a pollution problem due to suspended solids. A paragraph on page 3 of the pamphlet headed "Quantity required" refers to amounts comparable with the amounts of polymer used according to the patentees' invention. It is of interest to note that the pamphlet is headed "Mining Chemicals Department."

The article on polyacrylamide by A. M. Swift is primarily concerned with the uses of that compound in the paper industry, but states on page 225A in the right-hand column that hydrolysed products of polyacrylamide cause flocculation of many particulate substances, such as cements and clays.

The issues in this case are limited in that there is no dispute between the parties concerning the publication of the articles or concerning the identity of the polymers to which they refer with those with which the patentees' invention is concerned, although the articles do not appear to define those polymers in precisely the same terms as the patentees' claim 1. As regards the proportions to be employed, although Mr. Aldous stated that the onus was on the applicants for revocation to establish not only that the use of polyacrylamide was obvious, but also that its use in the proportions quoted in the patentees' claim 1 also was obvious, he did not develop that aspect of the argument, and as stated above the article concerned with "Aerofloc Reagents" recommends the use of proportions broadly comparable with those with which the patentees' invention is concerned, and no discussion on the matter of proportions took place at the hearing. The question to be answered may be said to be whether publication of the two articles would suggest to a person skilled in the art of making asbestos-cement products by the filtration process the use of polyacrylamides to assist that filtration. Filtration is a procedure necessary to and

common in many industries, and the two cited publications are concerned with the mining and paper industries and give most prominence to the applications of polyacrylamides in those industries. Neither publication mentions the asbestos-cement product industry so that there is no prior publication of the patentees' invention. However, filtration being, as stated, so very widely employed a procedure, and being apparently the key procedure in the manufacture of asbestos-cement products, it is not to be expected that persons concerned with development in the asbestos-cement industry would confine their technical reading to publications concerned with that industry alone, but would extend it to publications pertinent to other industries which dealt with filtration problems, and as evidence of this Mr. Watson states in paragraph 13 of his first declaration that he was regularly supplied with technical literature on flocculating agents by Cyanamid of Great Britain Limited, and that the literature so supplied included the two cited publications. The question to be answered may be more narrowly and precisely formulated by asking whether a person in Mr. Watson's position, concerned as such a person would be according to Mr. Watson's first declaration, with improving the filterability of asbestos-cement slurries without damaging the quality of the product, would be alerted to the possibilities of polyacrylamides in this connection by articles advocating their use in flocculating finely divided solids generally in aqueous suspensions and improving filtration rates of such suspensions, and would be spared the exercise of inventive ingenuity in arriving at the solution provided by polyacrylamides.

If this were all, the question in my view must be answered in the affirmative, since although Mr. Watson had been told privately about three flocculating agents which were polymers of acrylamide before receiving the publications, had been considering their use in his filtration process and had been endeavouring to obtain samples of them, he states in paragraph 13 of his first declaration that " there is no doubt at all that, if I had not already been led to consider the reagents described in these two papers, I should on reading them have seen that I ought to determine whether the reagents described in them would be of value in the manufacture of asbestos-cement." In fact, one of the three compounds referred to, namely Aerofloc 552, had been suggested to him by an American associate and is referred to in the "Aerofloc Reagents" article as formerly available and now replaced, so that it appears that Mr. Watson and his associates whether at home or abroad were anxious to obtain a flocculating agent that would help them in their particular problem and would scrutinise any literature references to flocculating agents referred to them with that in mind.

However, Mr. Aldous rested his case on the course of events which actually occurred when Mr. Watson made his first experiments with polyacrylamide. These experiments resulted in products of sub-standard quality, and Mr. Watson's company did not, at first, follow them up. Mr. Aldous argued from this that Mr. Watson had not been sufficiently convinced of the possibilities of polyacrylamides and hence that their use in the manufacture of asbestos-cement products could not be obvious, but if his argument is to be accepted, it would appear to follow, as a general principle, that a prior document on which an allegation of obviousness is based must have a rather more strongly impelling effect in the direction of the invention under consideration than is implied by the words " alerting to the possibility," if that allegation is to be established. It is of interest, in this connection, that although the applicants are making no objection on the ground of insufficiency, Mr. Watson states in paragraph 19 of his first declaration that he later found that it is essential to effect an adjustment not referred to in the specification, viz. to increase the felt speed of the machines normally employed in the asbestos-cement industry, when using polyacrylamides as flocculating agents, if the quality of the products is to

remain unimpaired, and that, in reply to this, all the witnesses for the patentees unite in saying that other methods than increasing the felt speed may be employed in order to compensate for the effect of the flocculating agents on the quality of the products, and go on to state that all such methods are well known to persons of ordinary skill in the asbestos-cement field, the suggestion being that reference thereto in the specification is unnecessary. Hence, it appears that a person normally skilled in the asbestos-cement field would certainly be alerted to the possibility of using polyacrylamides as flocculating agents by publication of the two documents cited, and according to the evidence filed on behalf of the patentees such persons would, in trying out the use of the agents, employ the usual techniques, well-known in the art, and achieve an increase in filtration-rate without bringing about any adverse effect on the quality of the product.

It follows that I must conclude that the broad idea of employing polyacrylamides as flocculating agents in the manufacture of asbestos-cement products was obvious and clearly lacking in inventive step at the priority date of the patent, having regard to the cited publications. No case has been argued before me based on any differences between the patentees' specification and the cited documents in respect of differences in definition or proportions of the polyacrylamides, and the possibility of such a case does not appear to have been contemplated by either party. It follows accordingly, that I revoke the grant of a patent and I award the applicants for revocation thirty pounds (£30) in respect of their costs.

The decision of the Patents Appeal Tribunal is set out below.

Lloyd-Jacob, J.—The patentees appeal from a decision of Mr. J. E. Mirams (superintending examiner acting for the Comptroller General) dated 12th August 1965 whereby he directed that the letters patent in suit should be revoked on the ground that the alleged invention was obvious and clearly lacking in inventive step.

The alleged invention the subject of the letters patent in suit relates to a process of producing shaped asbestos cement articles such as pipes and boards, which involves the filtration of aqueous slurries comprising asbestos fibres and hydraulic cement dispersed in water. The commonly used method, so the specification states, suffers from two disadvantages, namely

(i) a rapid decrease in the rate of filtration due to clogging by asbestos fibres and finely divided cement particles; and

(ii) product losses due to the passage of unfiltered solids into the filtrate.

The patentees propose the use of a defined flocculation agent to improve thickening operations and filtration rates, the main claim reading :— [see above].

The amide polymers so defined (polyacrylamides) were known at the priority date as extremely effective flocculants having a wide commercial use in the treatment of ores, mineral and metal particles, sewage, industrial wastes and chemical precipitates and the proportions specified in the claim are comparable with those recommended for these uses. This information is contained in a pamphlet entitled "Aerofloc Reagents" distributed by the makers of these polyamides—American Cyanamid Company—and is supplemented by the publication in Vol. 40, No. 9, of Tappi of an article by A. M. Swift, wherein hydrolysed products of polyacrylamide are stated to cause flocculation of many particulate substances including cements. Neither of these publications specifies the use of these agents for asbestos cement slurries, so that the issue their publication raises is that of obviousness.

The hearing officer concluded, as I think rightly, that the absence of any specific indication in these documents of a use for the material in the asbestos cement business was of no genuine significance, the interest in filtration problems being common to so many industries that materials of value to one would necessarily come to the attention of others. Indeed, the evidence filed in the present case confirms that the distribution list for the pamphlet "Aerofloc Reagents" included at least one manufacturer of asbestos cement articles. The notional question to be posed is, therefore, would a skilled worker in the asbestos-cement field, having added to his general knowledge on filtration problems the information available from the cited literature, see without difficulty that these newly introduced polymers would be of advantage in his filtration step. The hearing officer formulated the relevant question in somewhat different language, the difference being that instead of using the phrase "see without difficulty" he expressed it as "be alerted to the possibility." For my own part I cannot appreciate that any genuine difference is introduced by the variation of language, but, however that may be, the prima facie answer to the question posed in the language I have set out must be in the affirmative.

It is urged by the patentees that having regard to the evidence, this prima facie answer should be rebutted, or, if not wholly rebutted, sufficiently undermined to justify rejection of the plea of lack of subject matter as not clearly established. This evidence discloses that, between two and three years before the priority date of the letters patent in suit, the manager of the research department of the applicants for revocation had received samples of two different polymers of acrylamide and tested their effect as flocculating agents for asbestos-cement slurries. He found that the filtration rate was improved, but his investigations led him to conclude that the quality of the resultant product was adversely affected, whereupon he discontinued the investigation. In April 1960, after the priority date, he resumed his investigations using other polymers of acrylamide and obtained results which were sufficiently satisfactory as to warrant commercial adoption. The position as established by this evidence neither rebuts nor undermines the provisional finding of clear absence of subject matter. Having obtained the flocculating agents, he forthwith applied them in the production of shaped asbesos cement articles, and no variety of experience in the quality of the ultimate product, whether based on sound commercial reasons or not, can affect this immediate initial recognition of opportunity for such use.

I agree with the conclusion of the hearing officer and dismiss this appeal. The applicants for revocation are entitled to a contribution towards their costs of this appeal and I direct that Johns-Manville Corporation do pay to Turners Asbestos Cement Company Limited the sum of £50 0s. 0d. to that end.

On appeal, *R. G. Lloyd*, Q.C. and *Raph Lunzer*, instructed by *Woodham Smith, Borradaile & Martin*, appeared for the patentees. *Sir Lionel Heald*, Q.C. and *R. A. Stanley*, instructed by *Bird & Bird*, appeared for the applicants for revocation.

Lloyd, Q.C.—The invention here resides in the use of a known class of chemical flocculating agent, polyacrylamides, in cement asbestos manufacture. Prior to the priority date of the patent such flocculating agents had been used in the mining industry with the object of facilitating filtration by causing fine particles to coagulate and form a more porous filter cake. Before February 1959, the priority date of the patent in suit, it was the general experience that the introduction of flocculating agents decreased the strength of the filter residues. This is unimportant in most filtration processes where the filter residue is to be broken down for further treatment. The invention here resides in the discovery that, contrary to all expectation,

these flocculating agents did not have an adverse effect on the strength of cement asbestos. The hearing officer wholly misunderstood the scope of the invention. He failed to define the inventive step or to appreciate the significance of the patent to the skilled reader. He misdirected himself as to the evidence, failing to appreciate the significance of the disclosures, and failing to give adequate attention to the proved commercial success of the invention. The Patents Appeal Tribunal adopted the findings and the errors of the hearing officer. The cited documents are concerned with the mining industry, not cement asbestos manufacture. There have been many cases in which it has been shown that what might seem obvious to a non-expert, might in fact be non-obvious to the expert in the art for reasons peculiar to the industry. It has been held that where an invention had been used for wool, it was not obvious to use it for cotton. This is a very specialised and unusual industry and the evidence here is adequate to show that it was not obvious to apply flocculating agents used in the mining industry in cement asbestos manufacture. In the mining industry only speed of filtration matters. Here speed of filtration is desirable only insofar as it can be achieved without loss of strength in the resulting product. Both tribunals below entirely overlooked the strength of the problem which is fundamental to the present inventive step. It was obvious that flocculating agents would improve the speed of filtration. But here the inventive step resided in the discovery that the filtration could be speeded up without loss of strength.

The patentees seek leave to supplement their evidence on this appeal. Evidence in cases heard by the Patent Office is prepared by patent agents for the determination of the issues by technically qualified hearing officers or, possibly, on appeal by a similarly qualified Patents Appeal Tribunal. It is not within the reasonable contemplation of the parties that the case may eventually reach this court. Consequently, on the rare occasions when a case comes under section 87 to this court, the parties should be permitted to put in further evidence where complicated technical issues arise. [**Willmer, L.J.**—We do not grant leave to file further evidence and will give our reasons later.]

A patent ought only to be revoked outright under section 33 if there is no reasonable doubt that the alleged invention is not patentable. The court should ask whether it was obvious to choose the essential materials used in the process, and whether it was obvious that these materials would give a result better than that known before: *General Electric Co.'s Application* [1964] R.P.C. 413 at 452. It was not obvious for the skilled man in the art to have read the cited documents. Even if regarded purely as a question of filtration, you have to ask whether it was obvious that this flocculating agent, unlike others known hitherto, would give a better and unexpected result. The use of the polymer for the production of cement asbestos articles so as to produce a useful result was meritorious and provides good subject matter: *Hickton's Patent Syndicate* v. *Patents & Machine Improvements Co.* (1909) 26 R.P.C. 339 at 347. Once it is established that the idea is meritorious, the fact that it can be implemented simply and without modification to the machine in which it is used is unimportant. Here the invention resides in the recognition of the utility of a very simple step.

Invention resides in finding some useful process of manufacture and disclosing to the public that which has not been discovered by others: *Pope Appliance Corporation* v. *Spanish River Pulp Mills Ltd.* (1929) 46 R.P.C. 23 at 55. Here, Mr. Watson, the expert on behalf of the applicants for revocation (see declaration supra page 480), failed to get a practical result. Either he was in possession of the invention before the priority date of the patent or he was not. If he was, he has kept it to himself, and cannot thereby defeat the patentee. But the proper construction of his

declaration is that he failed to grasp the significance or utility of the invention, and thus supports the patentees' case that the invention was not obvious. The fact that the invention is performed using materials already known per se at the date of the invention is immaterial: *Lister* v. *Norton Bros. & Co.* (1886) 3 R.P.C. 199 at 205; and *Taylor & Scott* v. *Annand* (1901) 18 R.P.C. 53 at 63. In relation to the cited documents relied on as supporting the allegation of obviousness, the relevant questions which this court should ask are: (a) would the notional reader in the cement asbestos field have chosen or have been apprised of one or both of the prior documents in the normal course of his work; and (b) if the answer to the first question is affirmative, do the documents give him clear directions that he would get some advantage from their subject matter when applied to cement asbestos manufacture? [**Diplock, L.J.**—Would it not be sufficient if the context of the documents were such that he would consider it worth trying?] No. For the purposes of a finding adverse to a patentee in opposition proceedings, the cited document must clearly disclose the invention; *Millwood* v. *Martin & Biro Swan* [1956] R.P.C. 125 at 129 and 133. For the present purposes the Cripps question may be paraphrased thus :— Was it obvious to a worker in the field of cement asbestos manufacture, acquainted with the literature in the art, and aware that all flocculating agents hitherto known had adversely affected the strength of the end product, that polyacrylamide flocculating agents would give improved rate of production without any adverse effect on the quality of the end product? The answer to that question, particularly in the light of the evidence of Mr. Watson, must be negative. As to the question of the degree of disclosure required in prior documents before lack of inventive step can be found under section 14 or 33, see *Burgess's Application* [1956] R.P.C. 163 at 174. [**Russell, L.J.**—It cannot be right that to prove absence of inventive step it is necessary to show anticipation.] No, but I do not interpret that case as meaning more than that the documents must establish absence of inventive step beyond doubt. If the evidence shows that there was a prejudice in the industry, then the lead given by the cited document must be sufficient to overcome that prejudice. On the significance of commercial success of an invention see *Longbottom* v. *Shaw* (1891) 8 R.P.C. 333 at 336; and *Non-Drip Measure Co. Ltd.* v. *Strangers Ltd.* (1943) 60 R.P.C. 135 at 142. Both tribunals below failed to apply the proper tests or to appreciate the significance of commercial success. They failed to appreciate that Mr. Watson's use of the invention, if any, was secret, and should therefore be disregarded under the provisions of section 14(3), and that even had he been asked at the priority date of the invention whether it was obvious to him to use the invention, his answer would have been negative. It would be unjust at this stage on the basis of the limited evidence available to the court and without the patentees having had any opportunity of cross-examination to deprive them of the fruits of a very useful invention. It has at least the scintilla of invention necessary to support the patent. The intention of the Act is that a patent ought only to be rejected outright at this stage in its life in a clear and unambiguous case. This is not such a case.

Lunzer followed—With reference to the evidence given by Mr. Watson (supra page 481) in paragraph 8 he conceded that in 1955 a double problem existed, the attainment of an adequate speed of filtration without loss of quality. The double problem is so stated in the patent specification, it is confirmed by Mr. Watson, and again confirmed by the witnesses on behalf of the patentees. Furthermore, it is common ground that loss of *quality* was the bar hitherto to the adoption of flocculating agents. This is the most important point in the case, and yet nowhere is it mentioned in the decisions appealed from. In 1956-57 Mr. Watson did some experiments with polyacrylamides and his conclusion was that the *quality was worse* (para. 14). He

rejected polyacrylamides as being useless in cement asbestos manufacture because they added to cost and produced an inferior product. On his own evidence it was not obvious to him at the priority date of the patent that polyacrylamide flocculating agents could be used with advantage in cement asbestos manufacture. In 1958 the patentees made the invention the merit of which is not disputed. It results in very substantial economies in the industry. On 11th February 1959 the patent was applied for, and thereafter the patentees had no further need to maintain their discovery secret. In 1959 all the machines at Manville, New Jersey, U.S.A., were converted to use SEPARAN 2610 manufactured by the Dow Chemical Co. The reasonable inference from this fact is that that company probably tried to sell its SEPARAN 2610 to other cement asbestos manufacturers. Mr. Watson admits that he heard from a U.S. sister company in 1960 of the successful use of SEPARAN (para. 15). It is immaterial whether in 1960 he derived his information indirectly from the patentees because he admits that his subsequent work on SEPARAN was after the priority date of the patent.

To prove the invention obvious it only required an expert such as Mr. Watson to state on oath that in the light of the cited documents it would have been obvious to him at the priority date of the patent to employ the invention in cement asbestos manufacture. But in fact he said on oath the opposite. He said in paragraph 14 that he found it economically disadvantageous to practice the invention which he rejected as useless. In the light of this admission it is somewhat surprising that the applicants for revocation ever brought the case to a hearing at the Patent Office. Such an admission ought to be fatal to their case. Consider the scope for cross-examining Mr. Watson if this appeal is allowed and the validity of the patent is challenged in the courts. He is an expert witness whose evidence on obviousness is entitled to considerable weight. If he should be asked, was it obvious to you at the priority date of the patent to employ the invention, his answer, if it is to be consistent with his sworn evidence in these proceedings, would be negative. It has been asked, would an expert have thought it worth trying these flocculating agents. On the available evidence, the probability is that he would have so thought, but that he also would have reached the conclusion reached by Mr. Watson, namely, that this flocculating agent, in common with all hitherto known flocculating agents, had an adverse effect on quality. This court should ask the Cripps question and answer it on the basis of the only available evidence, namely, that of Mr. Watson. Was it obvious to the skilled cement asbestos manufacturer that these flocculating agents would (a) speed filtration and (b) not adversely affect the quality of the end product? On these facts the appeal should be allowed. To show the inadequacy of Mr. Watson's evidence in support of the allegation of obviousness it may assist to consider the following hypothetical case. Suppose that instead of keeping his findings to himself, in 1957 Mr. Watson had read to a learned society a paper publishing the whole of his findings as to the uselessness of polyacrylamide flocculating agents in cement asbestos manufacture. Such a publication would not be an anticipation. [**Diplock, L.J.**—But someone at the meeting would probably have pointed out that a simple adjustment of felt speed was all that was needed to overcome the problem created by the thicker laminations.] Not in 1957 or at any date before the priority date of the invention. Mr. Watson has admitted in paragraph 19 that it was only his later work carried out after 1960 which showed the causal relationship between loss of quality and increased lamination thickness. It is common ground that changing lamination thickness presented no problem in the art. But paragraph 14 of Mr. Watson's evidence is consistent only with his failure to recognise in 1957 that the adverse effect on quality, a common effect of all known flocculating agents, in this case could be overcome by a change in lamination thickness. Adopting the analogy of Farwell, L.J. in *Andrews' Patent* (1907) 24 R.P.C. 349 at 371 lines

26-40, his hypothetical paper would have stood out as a wrecked barque warning others of the uselessness of these flocculating agents in cement asbestos manufacture. The evidence in this case does not justify a finding that the invention is clearly lacking in inventive step with the consequent denial to the patentees of the opportunity of having the validity of their patent investigated by the courts.

The respondents were not called and the following judgment was read:

Diplock, L.J.—The appellants were the patentees of an invention described as a method of producing shaped asbestos cement articles. Its priority date was 11th February 1959, the date on which it was applied for in the United States of America. The respondents, on 15th May 1965, within a year of the sealing of the United Kingdom patent, applied for its revocation under section 33 of the Patents Act on the grounds set out in section 14(1)(e), which they particularised as: "That the invention claimed in each and every claim of the complete specification was at the priority date thereof obvious and clearly did not involve any inventive step having regard to the publication in the United Kingdom of an article by A. M. Swift entitled 'Polyacrylamide, a new, synthetic water-soluble gum' and a pamphlet published by American Cyanamid Company entitled 'Aerofloc Reagents.'" On 12th August 1965 the superintending examiner, on behalf of the Comptroller, after a hearing, gave a decision revoking the patent. The patentees appealed to the Patents Appeal Tribunal. In a brief judgment on 1st April 1966 the Tribunal dismissed the appeal. From this decision the present appeal is brought to this court.

The point of this appeal, if one sticks to it, is a short one. It must need be where an allegation of obviousness is based solely upon matter contained in two documents published in the United Kingdom before the priority date.

The jurisdiction to revoke a patent for obviousness under section 33 should be exercised on the same principles as the jurisdiction to refuse it upon application under section 14. Those principles are set out in the judgment of this court in the *General Electric Co.'s Application* [1964] R.P.C. 413. It is sufficient here to say that a patent should be revoked under section 33 only in a clear case. The superintending examiner, who is himself an expert and is assisted at the hearing by another examiner familiar with the class of patent into which the present patent falls, thought that this was a clear case. So did the Patents Appeal Tribunal, a judge of the High Court nominated by the Lord Chancellor because of his special familiarity with patent work who, after a distinguished career at the patent bar, has been dealing with this kind of issue on the bench for some seventeen years. In determining an issue of obviousness, both the superintending examiner and the Patents Appeal Tribunal are entitled to and do make use of their own knowledge and experience of the relevant scientific and technical background to the subject-matter of the alleged invention.

On an appeal on this kind of issue from concurrent findings by expert tribunals of this character, the Court of Appeal will naturally hesitate before substituting its own non-expert opinion for theirs. But it will, and should do so, if satisfied that their decision was wrong, or that the case for invalidity of the patent is not sufficiently clear to justify the preremptory remedy of revocation under section 33 instead of the more dilatory and costly procedure by action under section 32.

To assist the Court of Appeal in exercising this appellate jurisdiction it is necessary for it to be informed of the relevant scientific and technical background in so far as this is not already disclosed in the evidence on the hearing before the superintending examiner and the Patents Appeal Tribunal, or in the decisions appealed

from. The normal way of providing the court with information of this kind (which ex hypothesi is not controversial) is by explanation given by counsel in opening the appeal. If the scientific and technical background is complicated, it may be convenient for the parties, prior to the hearing of the appeal, to prepare an agreed statement about this to be proferred to the court at the hearing. This has been done in the past, and is a practice to be commended in appropriate cases. It has not been adopted in the present case, and for my part I think it was quite unnecessary. The present case is not a complex one, and the lucid explanations of such scientific and technical matters as are relevant which have been proferred by leading and junior counsel in the course of the lengthy hearing have satisfied me, at any rate, that I know what this case is about. Nevertheless (though only towards the close of his opening speech) leading counsel applied for leave to adduce further evidence said to relate to the prior art, and to be educative in character. This, he frankly conceded, was available at the time of the hearings before the superintending examiner and the Patents Appeal Tribunal, but was thought to be unnecessary there because those expert tribunals did not need this kind of education. It was not, however, accepted by counsel for the respondents that the further evidence thus sought to be adduced was uncontroversial. We see no reason for departing, in this kind of appeal, from the ordinary practice of the Court of Appeal as respects the admission of further evidence on final appeals, and we refused the application. If scientific or technical background information is necessary for the proper determination of an appeal of this kind, it should, if controversial, be dealt with in the evidence before the superintending examiner and the Patents Appeal Tribunal so that this court may have the benefit of their findings upon any matter in controversy; if uncontroversial, it can be dealt with in one or other of the ways which I have already indicated. That is how it has been dealt with in the present appeal.

And now to the short point in the appeal. To call it short implies no criticism of the length of the hearing. Counsel was justified in advancing all possible arguments to persuade us that it was not a clear case, and therefore inappropriate to be dealt with under the preremptory procedure for revocation under section 33. But as the only matters relied on as making the alleged invention obvious are contained in two documents, my judgment can be short compared with the length of the hearing.

The only claim on the complete specification which need be referred to is claim 1, which reads as follows :

> " A process of producing shaped asbestos cement articles by filtration of an aqueous slurry comprising asbestos fibers and hydraulic cement dispersed in water, characterised by adding to the said slurry prior to its filtration between about 0.005 and 0.2 per cent. by weight based upon the dry weight of the dispersed solids in the said slurry, of a water-soluble, high molecular weight polymer of an amide."

There then follows the chemical formula of a type of polymers known as polyacryl amides. These substances had been discovered some time before 1956. They were effective as flocculating agents, and according to the document: " Polyacrylamide, a new synthetic, water-soluble gum " by A. M. Swift had come on the market in semi-commercial quantities " recently " before September 1957. Flocculating agents have the property of causing finely divided solids in aqueous suspensions to adhere to one another so as to form agglomerations. Where solids in such suspensions are to be separated from the water by filtration, flocculation of the finely divided particles speeds up filtration for the simple reason that water drains away from a mass of larger particles faster than it does from smaller. It also reduces clogging of the

filter and loss of solids so finely divided that they pass through the filter. But, since the flocculating agent remains in the filtered product, it may affect the physical or chemical properties of that product.

Asbestos cement is a mixture of asbestos, cement and silica. It is prepared from a slurry (that is, a concentrated aqueous suspension of finely divided particles) of these ingredients. The process of producing shaped asbestos cement articles, such as pipes, from this slurry was well known and widely used at the priority date. The first step in this process is to pick up from a cylinder rotating in the wet mixing vat a thin skin of the slurry on a moving belt made of felt which acts as a filter through which the water is drained from the solids until the mixture has reached the right consistency to enable the skin of asbestos cement on the felt to be transferred mechanically to a revolving cylinder or mandrel, upon which it builds up in spiral layers or laminations until the required thickness for the pipe is achieved. There follows a curing process to which it is unnecessary to refer.

The part of this well-known process which is relevant to this appeal is the filtration of the slurry. Filtration is a process common to many industries, and the use of flocculating agents (of which there are many others besides polyacrylamides) to aid filtration was well known. But the flocculating agents available before polyacrylamide came on the market had, for various reasons, not been found effective for use in the production of shaped asbestos cement articles. The respondents' alleged invention consisted simply of adding to the mixture of suspended solids to be filtered in the process of manufacturing asbestos cement pipes the known, but recently developed, flocculating agent polyacryl amide in the proportions recommended by the manufacturers of that product. The successful use of this flocculating agent in the process calls for some adjustment in the operation of the manufacturing plant such as increasing the speed of movement of the felt filter, or adding more water to the slurry. Those adjustments are not referred to in the specification, and it is now common ground that it was unnecessary to do so, for the need for adjustments and the nature of those required would be obvious to anyone skilled in the industry. Their introduction would accordingly involve no inventive step.

If there is any inventive step involved in the appellants' claim, it is in the idea of using a known, but recently developed, flocculating agent in a known filtration process in which it had not been used before. This idea, when put into practice as indicated in the specification, with the necessary but unspecified adjustments to the plant, does produce substantial economies of manufacture. If the idea was not obvious, the invention claimed is patentable.

The respondents' case was simply that " a person versed in the art " of manufacturing asbestos cement pipes (which nowadays means a hypothetical and highly qualified technologist in the research department of asbestos cement pipe manufacturers) would be likely to read the two publications referred to, and that if he did so the information which they contained about polyacrylamides would make him realise that here was a flocculating agent which was well worth trying out in the filtration process used in his own industry in order to see whether it would have beneficial results. If that had been established, the respondents in my view have made out their case that the idea of using polyacrylamides as floucculating agents in the manufacture of cement asbestos pipes was, at the priority date, " obvious and clearly did not involve any inventive step."

I have endeavoured to refrain from coining a definition of " obviousness " which counsel may be tempted to cite in subsequent cases relating to different types of claims. Patent law can too easily be bedevilled by linguistics, and the citation of a

plethora of cases about other inventions of different kinds. The correctness of a decision upon an issue of obviousness does not depend upon whether or not the decider has paraphrased the words of the Act in some particular verbal formula. I doubt whether there is any verbal formula which is appropriate to all classes of claims. The superintending examiner used the expression "alerted to the possibilities" of using polyacrylamides in improving the filterability of asbestos cement slurries. I find no fault with this phrase in the context of the claim in the appellants' specification. The learned judge preferred the expression "see without difficulty that these newly-introduced polymers would be of advantage in his filtration step." I think that "would be" puts it too high if it postulates prior certainty of success before actually testing the polymers in the filtration process; it is enough that the person versed in the art would assess the likelihood of success as sufficient to warrant actual trial. I do not, however, understand that the learned judge meant more than this, for he did not consider that there was any genuine difference between his phrase and that used by the superintending examiner.

The publications relied upon are a sales pamphlet entitled "Aerofloc Reagents," which contains the manufacturers' particulars of polyacrylamide flocculating agents, and directions for their use. It does not refer specifically to their potential value in asbestos cement manufacturing, but deals primarily with their commercial application in various kinds of mining industries in which the flocculation of mineral particles in aqueous solution can be of advantage. Asbestos, cement and silica are, all three, minerals. The second document, an article by Mr. A. M. Swift in a technical journal of the pulp and paper industries, refers specifically to the flocculating effect of polyacrylamides upon (inter alia) cement and clay particles. The polyacrylamides were stated to be effective in very small quantities. As compared with other flocculating agents they would thus be present in minute quantities only in the filtered product. The superintending examiner and the Patents Appeal Tribunal were both of opinion that, filtration processes being common to many industries, these documents, although addressed primarily to the mining and paper industries respectively, were likely to be read by those concerned with the asbestos cement industry, and that such readers would have realised that here was a newly-introduced flocculating agent which it was well worth trying out in their own filtration process. I can see no grounds which would justify this court in reversing this concurrent finding by two expert tribunals. And there, but for an argument to which I must now advert, is an end of this appeal.

It has been contended with protracted vigour in this court, as it was before both tribunals below, that the action which was in fact taken by a particular witness, who was an actual research worker in the asbestos cement manufacturing industry, when polyacrylamides were first drawn to his attention, demonstrates that these concurrent findings were wrong. The individual was the manager of the respondents' own research department, who made a statutory declaration in support of their application. His evidence discloses that when he first heard of polyacrylamides (which was before the documents relied upon were published) he sought to obtain samples in order to see whether they would be effective flocculating agents for use in the filtration process involved in the manufacture of asbestos cement pipes. As a result of his inquiries he obtained trial quantities of polyacrylamide from the manufacturers, and subsequently received from them the documents relied on when they were published in 1957. In 1956 he carried out experiments with a polyacrylamide and asbestos cement slurry. He "found that it improved the filtration of the slurry, but that this resulted in the formation of a thicker skin of asbestos cement being transferred from the felt filter belt to the revolving cylinder, and a corresponding reduction in the number of laminations for a given thickness in the final product.

This had an adverse effect upon its quality." He accordingly abandoned his experiments in 1957, and did not resume them until 1960 (that is, after the priority date of the applicants' specification). He then found out for himself that by speeding up the rate of travel of the belt, the thickness of the skin of asbestos cement upon the felt could be reduced, and the number of laminations correspondingly increased so that the quality of the final product was unimpaired.

In so far as this witness obtained literature about flocculating agents used in other industries, and realised, as soon as he heard of them, that polyacrylamides were well worth trying out as flocculating agents in his own industry of manufacturing asbestos cement pipes, his evidence confirms the opinion of the superintending examiner and the Patents Appeal Tribunal that the idea of trying out these newly-introduced flocculating agents in the filtration process in that industry would be obvious to persons "versed in the art." His failure to persevere with his experiments, when he found that the skin of asbestos cement upon the felt filter was too thick, would be cogent evidence for the appellants if the invention claimed in their specification included an adjustment to the speed of the filter belt. But there is not a word about this in their specification. If, appreciating the necessity for such an adjustment involved any inventive step, the specification could be attacked upon the alternative ground set out in section 14(1)(g), namely, that it "does not sufficiently and fairly describe the invention or the method by which it is to be performed." But it is (and so far as the appellants are concerned, it has to be) common ground that, once the idea of adding polyacrylamides to the asbestos cement slurry used in the manufacture of asbestos cement pipes has been tried out, and the thicker skin of asbestos resulting from the improved filtration observed, the necessary adjustment to the speed of the filter belt to obviate any deleterious effect upon the quality of the final product would be obvious, notwithstanding that the respondents' own research manager did not find it so.

All that this evidence shows is that this particular witness's glimpse of the obvious was spasmodic. To this extent he was atypical of the hypothetical person "versed in the art" of manufacturing asbestos cement pipes, whom the superintending examiner, the Patents Appeal Tribunal and this court must postulate as reading the publications relied upon, and drawing from them those conclusions about the likelihood of polyacrylamides being useful in that manufacture, to which his skill, his knowledge and his experience would lead him. Like the learned judge, I see nothing in this evidence to throw doubt upon the conclusions reached by the superintending examiner and by the Patents Appeal Tribunal itself that the idea of adding a polyacrylamide to the asbestos cement slurry in the manufacture of shaped asbestos cement articles was obvious having regard to the information published in the two documents relied upon.

I would dismiss the appeal.

Russell, L.J.—First, were the cited documents properly to be treated as part of the technical equipment available to those skilled in the manufacture of asbestos cement? As to that, both the superintending examiner and the Patents Appeal Tribunal thought so, and so do I, because clearly every aspect of the filtration of solids suspended in a fluid must be of interest and concern to such a person. Nor am I persuaded to the contrary by the apparent fact that Mr. Watson did not in fact come across these two documents until he had applied to the British Cyanamid Company for a sample of one of these flocculating agents.

Second, would the cited documents, if read by such a person skilled in the cement asbestos manufacture as part of his technical equipment, point to the use of this

agent in aid of filtration in the manufacture of cement pipes so as to make it clearly obvious to take the step? Both the tribunals below thought so, and so do I. Nor do I think that Mr. Watson's experiences and attitudes show otherwise. The fact that Mr. Watson gave up trying without recognising that any resultant defect in quality was unnecessary if obvious mechanical adjustments were made does not make the application of this agent to cement asbestos manufacture other than clearly obvious; it only tends to show that Mr. Watson missed another obvious point.

I would dismiss the appeal.

Willmer, L.J.—I agree with both judgments which have been delivered. I would, however, desire to associate myself particularly with what Diplock, L.J., said as to the undesirability of coining phrases for the purpose of paraphrasing the words of the Act. The words which have to be applied in this context are those of section 14(1)(e), namely, that the invention " is obvious and clearly does not involve any inventive step." Those are ordinary English words of well-known significance.

It is admitted that the question to be decided on an application under this section is in substance a jury question; but the jury provided for the purpose of deciding the question is, if I may so describe it, a very highly skilled and informed jury in the person of the hearing officer, assisted by his fellow examiner. Where that tribunal, with the advantage of its expert knowledge, has reached a conclusion, and still more where that conclusion has been confirmed by the expert opinion of the learned judge sitting in the Patents Appeal Tribunal (that is to say, where there have been in effect concurrent findings of fact by expert tribunals), it would, I think, need a very strong case indeed to justify this non-expert court in interfering with a decision which, as I have said, was basically a jury question.

I agree that the appeal should be dismissed.

Appeal dismissed with costs. Leave to appeal to House of Lords refused.