116736 Canada Inc. v. The Queen, 1998 560 (TCC)
1998-06-09

Date: 1998-06-09

Docket: 96-2484-IT-I; 96-4372-IT-I

BETWEEN:

116736 CANADA INC.,

Appellant,

and

HER MAJESTY THE QUEEN,

Respondent.

Reasons for Judgment

Archambault, J.T.C.C.

[1] The Appellant is challenging notices of assessment respecting its 1989 to 1992 taxation years and a notice of determination respecting its 1993 taxation year issued by the Minister of National Revenue (Minister). For each of these taxation years, the Appellant claimed scientific research and experimental development (R & D) expenditures.

[2] The Minister disallowed all these claims on the basis that the Appellant had not provided any evidence that scientific or technological work was ever performed. The amounts claimed by the Appellant are the following:

Years Gross R & D / Expenditures Claimed / ITC Claimed

- 1989 / $ 7,418 / $ 1,558
- 1990 / $25,439 / $ 5,342
- 1991 / $35,280 / $ 7,409
- 1992 / $53,105 / $11,648
- 1993 / $49,215 / $10,946

Facts

[3] The Appellant was incorporated in the mid-1980s. Its business is that of holding patents and developing technology in the transportation field. One of its shareholders and key man in its business is Mr. Richard Nelson who testified during the hearing. He described himself as a businessman and inventor. Mr. Nelson graduated from the Kemptville College of Agriculture in 1972. Among his first projects, Mr. Nelson tried to develop new technologies in the field of agriculture. He was looking for new ways of improving materials used in the construction of nursery greenhouses, shade structures and biotechnology plants. He has worked in cooperation with many government and university greenhouse research facilities around the world, including NASA laboratories. As a result of his expertise in agricultural technology, he has obtained private consulting work with clients looking into possible investment in projects in France, India, Morocco and Egypt.

[4] Mr. Nelson, either personally or through corporations, has been granted in seventeen countries broad patents for four fundamental inventions. In 1985 he received a $160,000 technology grant for demonstrating the first large-scale Thermactive membrane roof system prototypes incorporating removable liquid insulation, a technology that he developed in 1982. A limited partnership was established to raise over $3 million to finance an R & D program. According to Mr. Nelson, this partnership successfully passed the Minister's R & D audits. Marketing of the results of these R & D projects is currently under way. A company in Alberta is building a 12,000-square-foot greenhouse worth approximately $1 million. Mr. Frederick Klein, an architect, testified that he was involved in marketing this technology.

[5] In addition to his projects related to agriculture, Mr. Nelson was interested in carrying out R & D work for the creation of novel transportation technologies with a view to the reduction

of fuel consumption. He explored unconventional approaches to alternative energy systems for transportation through the application of new proprietary mechanisms. His projects included personal human-powered transportation devices as well as multi-person or cargo transportation by air or water.

[6] From August 1988 to February 1993, Mr. Nelson, through the Appellant, was involved in five projects which may be identified as follows:

Project A Wheel-Fly-Wheel (Fly-Wheel)

Project B Vortex-Flow Fly-Wheel (Vortex)

Project C Ground Frame

Project D Air-Frame

Project E Power Boot

These projects involved both design studies and the construction of prototypes. Some of them extended over the whole relevant period while some were only started later on.

[7] During the 1989 fiscal period, Mr. Nelson spent approximately 20 days carrying out by himself two design studies for which he received $7,418. In carrying out the first project, the Fly-Wheel Project, Mr. Nelson was trying to design technology that could be integrated into lightweight transportation devices. This project involved the development of a small-sized, high density flywheel to be installed in light wheels used in bicycles or in even smaller wheels such as roller skate wheels. This system would permit regenerative braking so that slowing down or stopping would result in stored energy availability in the flywheel for reaccelerating or for regaining forward motion without significant human energy input. A special gear mechanism located in the wheel hub would provide proper mechanical linkage of the wheel to the flywheel. The greatest difficulties were related to the linking of the flywheel energy to a drivetrain for power input and also to controlling the mechanical linkage between the flywheel and the wheel. This first design was found to be excessively complex.

[8] A design study was also carried out with regard to the third project, the Ground Frame Project. Mr. Nelson tried to develop a lightweight structural design for a means of reducing "drag" over a motor vehicle body; into this design would be integrated the design of energy storage devices and a novel fluid-dynamic process. This fluid-dynamic or the vortex flow process can be described as a technology using a horizontal rotor placed at the nose of a vehicle,

thereby creating a new aerobody which would transfer forward propulsion to the vehicle body by means of fluid-dynamic forces. This rotor takes up the full frontal area of the vehicle and is coupled to the two front powered wheels. Mr. Nelson hoped to achieve negative drag by implementing such technology. The design study for this project continued more than halfway into the 1990 fiscal period.

[9] During the 1990 fiscal period, in addition to the Ground Frame Project, Mr. Nelson started working on the Vortex Project. Mr. Nelson wanted to test certain airflow concepts. He believed that the application of the Vortex airflow concept to a vehicle body design could be a method for combining energy storage, improvement in aerodynamic behaviour and drag reduction. Mr. Nelson built one automotive model which was tested in an in-house wind tunnel. This was done on a very small scale.

[10] During this period, initial design concepts were also developed for the Air-Frame Project and the Power Boot Project. These involved investigations into the application of the fluid-dynamic propulsion system to aircraft design and the application of the flywheel concept to a powered roller skate.

[11] Mr. Nelson pursued his Fly-Wheel Project by experimenting with an orbit linkage as opposed to a hub linkage. In this new system, the flywheel is positioned within a bicycle driving wheel with a planetary gear linkage between the wheel rim and the outer circumference of the flywheel. This project was carried on well into the 1991 fiscal period.

[12] All the work required for these projects was carried out in 1990 by Mr. Nelson alone. He received $25,439, which represents approximately 70 days of work.

[13] The work done during the 1991 fiscal period related to the Fly-Wheel Project, the Vortex Project, the Air-Frame Project and the Power Boot Project. Mr. Nelson carried out this work during approximately 90 days and received $35,280. With respect to the Fly-Wheel Project, after having done more design studies on the alternative orbit linkage system, Mr. Nelson experimented with a preliminary model. A prototype was constructed using a planetary roller set located between the outer circumference of the flywheel and the inner circumference of the wheel rim. Small working models were constructed in order to verify the basic relationships of the components and to stimulate both further studies and the use of the flywheel in vehicular systems. At the request of Mr. Nelson, patent agents reviewed the patentability of the projects. Apparently their opinion was that this technology was patentable.

[14] Mr. Nelson also worked on his Vortex Project. In 1990, the Vortex concept was configured to achieve aerodynamic lift by means of coupling in tandem two vortex units placed

in parallel and in close proximity and rotating towards each other. The design studies carried out during the 1991 fiscal period focused on the application of the vortex flow concept to automotive design and cargo transport. In the same period, another design study was carried out in which the tandem vortex units were permitted to spin on their centre of gravity, thereby forming the shape of a torus. This system, according to Mr. Nelson, could be used for helicopter-type machines. This project was carried on well into the 1992 fiscal period.

[15] Design studies were carried out with respect to the Air-Frame Project. The objective was to develop an aircraft design using the vortex technology. Two different configurations were investigated by Mr. Nelson. In the first one, the envelopes of the cylinder rotor were pressurized by hydrogen, helium, hot air or hot vapour. In the second configuration, the buoyancy of the airframe was derived from systems in which low pressure was maintained within a porous rotating envelope.

[16] Finally, Mr. Nelson worked on an initial prototype of a "power boot" design. It was configured as a roller skate type of device designed to maximize the potential utilization of human power inputs. The power boot design included an articulated frame which created movement by shifting one's balance from one foot to another in a normal walking motion. Several full-scale prototypes of such an articulated frame were partially or fully constructed and tested.

[17] During the 1992 fiscal period, Mr. Nelson, with the assistance of a technician from one of his other ventures, worked on the construction of prototypes for the power boot. Mr. Nelson received $40,000 for this, which represented approximately 100 days of work. The technician received $9,559, which represented 126 days of work.

[18] During this period, significant efforts were made to accelerate work on the power boot project. Several prototypes were constructed and tested for performance and behaviour in order to obtain feedback for the design process. He tried to simplify the steering mechanism by using a simple lean-to-steer system. Three prototypes were built using one frame on each foot while the fourth consisted of a uniframe stepper mechanism on which a person could stand. Work on the fourth prototype was carried on well into the 1993 fiscal period. Mr. Nelson is confident that his efforts can result in a patentable and commercially viable product.

[19] More design studies were carried out with respect to the Fly-Wheel, the Vortex, the Ground Frame and the Air-Frame Projects. On the Fly-Wheel Project, further design studies were undertaken with a view to improving and simplifying the mechanical drive system. As to the Vortex Project, the design study started in 1991 and continued in 1992.

[20] The objective for the Ground Frame Project study was to apply the flywheel system to a light single-passenger commuter vehicle. Plans were developed to begin construction of a prototype, which required sourcing of mechanical parts, the manufacture of special parts, some assembly of frame and body, and the development of some system for steering and braking.

[21] A new design study was also begun with respect to the Air-Frame Project. The objective was to analyze different methods of achieving the vortex flow effect and to use this effect to create the aerodynamic lift. In this new design study, the envelope of the rotor was replaced with a system of rotating blades having an airfoil cross-section so as to induce low-pressure buoyancy.

[22] For the fifth fiscal period, that is, 1993, almost all of the work involved building and experimenting with prototypes. The projects combined the development activities of the Vortex, Ground Frame and Air-Frame Projects. The research had as its objective the development of a scale-model prototype of a new type of personal watercraft for one or two passengers. In Form T661 filed with the Minister, the Appellant describes the technical work done and the progress made during that fiscal period. Mr. Nelson constructed frames in order to determine the optimum lightweight structure that could be used in an aero-hydroplane application. Rotors of different shapes were tested and used in combination with different electric motor drive set-ups. Rotors with smooth surfaces and rotors with rifling-type ridges were tested. Models with various battery power arrangements were tested so as to determine power and weight ratio requirements. A working scale model with full remote control system was built for testing over water but was found to have excessive weight to displacement at that scale.

[23] The frame was carefully studied with a view to maximizing rigidity while maintaining minimum weight. It was rebuilt in three variations to improve balance and flotation characteristics. The work on the Fly-Wheel Project was used in combination with the hydroplane project through the study incorporating the same mechanical linkage as that developed for the wheeled vehicles.

[24] To carry out this work, in addition to Mr. Nelson, the Appellant used the services of one technician and two draftsmen. Mr. Nelson stated that he could not determine the whereabouts of the technician. However, he did not say why he was unable to have any of the two draftsmen testify.

[25] As can be seen from the above description of the various projects which the Appellant carried out during the relevant period, they involved very complicated technical experiments. As appears from the T661 forms filed by the Appellant, the projects involved a high level of technological uncertainty. The Appellant's goal was essentially to find alternative energy system

for the transport sector. The object of the work undertaken by the Appellant has remained, after five years, an elusive one. Mr. Nelson thinks however that all the work undertaken by the Appellant during the relevant period may result in the near future in a patentable power boot system. The creation of a completely new mechanism that would significantly reduce energy demand appears to be a difficult goal to achieve. I therefore have no doubt that all the experimental development work undertaken by the Appellant was in areas of technological uncertainty.

[26] In support of his contention that he carried out the work, Mr. Nelson produced some drawings, notes and references. The supporting documents are from pages 76 to 144 of Exhibit A-1. Among these notes are a 25-page document describing a human power boot for personal transportation and recreation. This device basically incorporates several products of the experimental development carried out by the Appellant, including the flywheel system.

[27] Mr. Nelson stated that, because of a fire that took place on August 4, 1994, he was unable to produce more notes or some of the models that were built during the relevant period. A proof of loss filed by Mr. Nelson with the insurer was entered as an exhibit.

[28] Mr. Ivanov, a scientific advisor to the Minister, testified on behalf of the Minister. Mr. Ivanov was involved in auditing the claims filed by the Appellant for its R & D projects. After having reviewed the information sent to the Minister, he concluded that the description of the various R & D projects was not adequate. He therefore sent the Appellant a letter dated March 26, 1992 requesting additional information, namely: a description of the qualifications and experience of the personnel in charge, a description of the work performed, of the progress made and of the results achieved in the taxation years under review, information as to the starting and end dates for all projects, and a list of the reports and documentation which described the progress or outcome and which could be used to verify the technical aspects of the claims.

[29] Mr. Ivanov received a report dated April 22, 1992 (the April Report)[1] and a chart describing on a project-by-project basis design studies and prototype construction carried out by the Appellant from June 1988 to February 1993. The April Report provides the following information:

1) Brief description of the project in technical terms
2) The technological advancement sought
3) A description of the technological uncertainties
4) A description of the actual technical work done during the period of the claim and
5) A description of the linked activities undertaken directly in support of a project.

[30] After reviewing the April Report and the chart, Mr. Ivanov concluded that the information was not sufficient evidence of the actual work done. He met with Mr. Nelson in May 1992 and asked for evidence of his work. He then saw three mock-ups and the frame that could have been used in the Ground Frame Project, but without any of its rotors. Mr. Ivanov stated that he was not presented with any calculation that would have been generated by tests. According to him, such calculations would have established that the experimentation took place. Records were required in order to establish that a systematic study was carried out. A subsequent meeting in July 1992 did not produce any new evidence.

[31] On August 17, 1992, Mr. Ivanov wrote again asking for documentation and calculations relating to each of the projects undertaken by the Appellant. Furthermore, he wanted more detailed information on the time spent on them, the expenses incurred and the kind of work performed.

[32] On December 18, 1992, Mr. Ivanov wrote again to the Appellant requesting more information and in particular a precise and concise description of the technical work done on each project, material proof of work done, and a description of the prototype constructed, of the tests carried out and of the results of the testing. Information was also requested concerning the periods during which each project was carried out, the amount of time spent on them and the kind of work performed with respect to each of the R & D projects. Mr. Ivanov requested as well a list of all existing progress reports and documents related to the R & D activities.

[33] On February 10, 1993, the Appellant sent the Minister a report (February Report)[2] providing a description of the technical work done and of the documents generated during the relevant period, and indicating the starting and end dates of each of the projects and the persons involved in each project, in addition to setting out the amount paid and the estimated number of days spent on the projects by these persons.

[34] Mr. Ivanov was not satisfied with the information provided by the February Report. It did not contain any photographs of the models built by the Appellant. Nor did it provide sufficient information with respect to the dates on which the work was supposedly being performed.

[35] On May 17, 1993, Mr. Ivanov wrote his report in which he concluded that he had only received general theoretical descriptions. The content of the letters and documents received was not sufficient to evidence the R & D character of the Appellant's activities. "The evidence of the SR & ED work done is insufficient to meet the requirements for proof of technical content (per IC 86-4R2, 2.10.3), or the Experimental Development or Systematic Investigation as required in Regulation 2900." Therefore, the projects did not qualify as R & D projects. Here is his evaluation of each of the projects:

> EVALUATION OF THE PROJECT:
>
> 1. WHEEL-FLY-WHEEL -
>
> Preliminary specifications. Conceptual development of new configurations. No experimentation.
>
> 2. VORTEX-FLOW-FLYWHEEL -
>
> Initial specification written. No prototypes. No experimentation.
>
> 3. GROUND FRAME DEVELOPMENT -
>
> Theoretical studies. No prototype. No experimentation.
>
> 4. AIR-FRAME -
>
> Theoretical studies. No prototype. No experimentation.
>
> 5. POWER BOOT PROJECT -
>
> Mock-ups constructed. No evidence of testing & results.

[36] Mr. Ivanov had also been involved in reviewing R & D projects carried out by a sister company, Thermactive Systems Corporation Ltd. (Thermactive) during the taxation years 1989, 1990 and 1991. He initially took the view that the projects carried out by Thermactive did not qualify as R & D. After having been provided with more information, the Minister apparently approved most of these projects. When I questioned Mr. Ivanov as to what made the difference, Mr. Ivanov answered that, in Thermactive's case, he saw the results, that is, he saw the constructed greenhouse which was functioning and producing the effect for which it was designed. He also saw some of the drawings.

Analysis

[37] The relevant section of the Income Tax Regulations (Regulations) defining R & D for purposes of section 37 of the Act is section 2900 which reads as follows:

PART XXIX

Scientific Research and Experimental Development

INTERPRETATION

2900. (1) For the purposes of this Part and paragraphs 37(7)(b) and 37.1(5)(e) of the Act, "scientific research and experimental development" means systematic investigation or search carried out in a field of science or technology by means of experiment or analysis, that is to say,

(a) basic research, namely, work undertaken for the advancement of scientific knowledge without a specific practical application in view,

(b) applied research, namely, work undertaken for the advancement of scientific knowledge with a specific practical application in view, or

(c) **development**, namely, **use of the results of basic or applied research for the purpose of creating new, or improving existing, materials, devices, products or processes ...**

[My emphasis.]

[38] Essentially, the issue in this appeal is whether a systematic investigation took place. The scientific advisor to the Minister concluded that it did not because he was not given sufficient evidence to prove such an investigation had been carried out. Essentially, he was not provided with adequate reports describing the progress of the R & D projects and more specifically describing the types of tests performed, the results achieved, etc.

[39] Counsel for the Respondent argued that a systematic investigation cannot have taken place in the absence of detailed reports evidencing step-by-step the investigation carried out by the Appellant. Here, there is no evidence of calculations having been done in the course of the investigation. Therefore, in counsel's view, there was not enough evidence to support the conclusion that a systematic investigation took place.

[40] In my view, contemporary reports showing detailed records of each experiment attempted by a researcher could constitute evidence of a systematic investigation. Any taxpayer attempting to convince the Minister that he is entitled to deduct R & D expenditures without such evidence puts himself in a very precarious position. A taxpayer would be in a similar position when appearing before this Court to contest the Minister's refusal to allow the deduction of his R & D expenditures.

[41] However, the Act and the Regulations do not require that such written reports be produced in order for a taxpayer to qualify for the deduction of such expenditures: it is possible to adduce evidence by way of oral testimony. Whether the Minister or a judge could conclude that the activities purported to have been carried out by the taxpayer were actually carried out then becomes a question of credibility.

[42] In this particular case, I am satisfied on the balance of probabilities that a systematic investigation took place and that the Appellant attempted to develop new technologies that involved either applied research or experimental development.

[43] However, I would add that it is not without hesitation that I come to this conclusion. It is surprising that the Appellant was not in a position to show to the Minister's representative in the course of his audit the prototypes that had been built at the time of that audit. However, on the balance of probabilities, I am inclined to believe Mr. Nelson when he says that R & D activities took place during the relevant period. The fact that he is an inventor and the fact that he was involved in projects of an R & D nature which resulted in the creation of new technologies that are being commercially marketed give the Appellant more credibility. However, just because he actually carried out R & D activities on behalf of one company it does not necessarily follow that he did so on behalf of the Appellant. As mentioned before, it boils down to a question of credibility. Having reviewed the April and the February Reports providing a detailed description of the work done during the relevant period and having heard Mr. Nelson's oral testimony, I find that those activities constituted R & D. I observed Mr. Nelson during his testimony and he came across as an honest and credible witness.

[44] For these reasons, I conclude that the activities carried on by the Appellant constituted R & D within the definition of section 2900 of the Regulations and its appeals for the 1989 to 1993 taxation years are allowed.

[45] The notices of assessment and the notice of determination are referred back to the Minister of National Revenue for reconsideration, reassessment and redetermination on the basis that the expenditures claimed by the Appellant constitute R & D expenditures.

Signed at Ottawa, Canada, this 9th day of June 1998.

"Pierre Archambault"

J.T.C.C.

[1] The April Report is from pages 62 to 75 of Exhibit A-1.

[2] Pages 47 to 61 of Exhibit A-1.

•Austin v. The Queen, 2001 855 (TCC)

•Carpenter v. The Queen, 1998 217 (TCC)

•Jodoin v. The Queen, 2004 TCC 708

•Skaling v. The Queen, 2011 TCC 180

•Karmali v. The Queen, 2001 667 (TCC)