

COMMISSIONER'S DECISION

OBVIOUSNESS: Aerosol Containers for Anaerobic Resin-forming Compositions

An aerosol packaged anaerobic resin-forming compositions which set in the absence of oxygen in pressurized aerosol containers to which he added oxygen to prevent hardening. It was held there was no invention in view of the prior art which showed the necessity of oxygen to inhibit hardening.

Rejection: Affirmed

This decision deals with a request for review by the Commissioner of Patents of the Examiner's Final Action dated January 23, 1975, on application 115,800 (Class 222-55). The application was filed on June 16, 1971, in the name of Denis J. O'Sullivan et al, and is entitled "Anaerobic Compositions." The Patent Appeal Board conducted a Hearing on June 9, 1976, at which Mr. N. Eades represented the applicant.

The application relates to anaerobic compositions which are packaged in aerosol containers. The container is pressurized with a propellant containing oxygen as one component. The compositions remain stable and usable for periods of six months or longer.

By "anaerobic compositions" are meant polymerizable compositions, which do not set in the presence of oxygen, but do polymerize in the absence of oxygen, i.e. they are anaerobic. One example is "loctite" a resin-forming composition which, when coated over nuts and bolts, sets to hold the nut firmly on the bolt. This avoids the necessity of using lock washers under the nut.

In the Final Action the examiner refused the application for failing to disclose a patentable advance in the art. The following references were cited:

United States Patent

2,895,950

July 21, 1959

Kriebel

Shepherd "AEROSOLS: SCIENCE & TECHNOLOGY" 1961, Chapter 6

The Kriebel patent describes an anaerobic composition comprising a mixture of polymerizable acrylate ester and a peroxy polymerization initiator therefore. The peroxy polymerization initiator is a hydroperoxide initiator.

In the Final Action the examiner stated (in part):

Allowance of this application is refused since the method of packaging the anaerobic compositions discussed in the disclosure is considered to be obvious to one skilled in the aerosol container art. Furthermore, the compositions themselves, which are intended to be packaged in aerosol form, are not new.

Considering the compositions per se, applicant has admitted in his letter of April 8, 1974 that Kriebel as well as a number of other patents disclose anaerobic compositions. The sole question to be considered then is whether the packaging of an anaerobic composition in aerosol form is inventive.

As disclosed on page 2, paragraph 4, "the invention deals with anaerobic compositions packaged in liquid aerosol form". The examiner has not cited a patent for an aerosol container against the claims since as the applicant states in his disclosure, "the containers ---- may be any suitable container capable of withstanding the super-atmospheric internal pressures required of such systems". Thus any suitable aerosol container may be used so there is no actual invention in the container per se. As the applicant states in his letter of January 5, 1973, the alleged invention lies in packaging an anaerobic composition in a sealed container of known type.

As disclosed by applicant, anaerobic curing compositions are catalyzed polymerizable compositions which are stable in the presence of oxygen but which solidify when oxygen is excluded. It is considered to be entirely within the skill of a person working in the aerosol packaging art and in fact blatantly obvious that if one wished to package an anaerobic composition in aerosol form, one merely ensures that there is oxygen present within the container to maintain the composition in a liquid state.

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Applicant argued that there is no suggestion in the Kriebel patent or other patents for anaerobic compositions, of aerosol packaging techniques extended to anaerobic compositions. Furthermore, that these compositions have previously been used only in low density polyethylene containers, as attested by Mr. Heilig a director of the Loctite Corporation. This is not a point of contention. The examiner has not argued that anaerobic compositions have been previously packaged in aerosol form. It may not be obvious to persons skilled in the art of development of an aerobic composition how to package such compositions in other than low density polyethylene containers, however, it is considered to be obvious to a man skilled in the aerosol packaging art that, once told oxygen must be present, he merely ensures oxygen is present in the propellant when packaging such a composition. As pointed out previously, one problem in aerosol packaging is ensuring there is no reaction between the contents and the propellant. Thus the use of inert gases. It would appear that when such a reaction is not only desirable but necessary, as in this case, the packager's problems are simplified.

Applicant admits that he has not disclosed a new composition per se. Applicant also admits that the containers per se are of known type. It is considered to be obvious to one skilled in the aerosol packaging art to include oxygen in the propellant when packaging anaerobic compositions in aerosol form so that they will not solidify. The minimum amount of oxygen necessary in relation to the remainder of the gases in the propellant is derived by simple trial and error experimentation. Applicant has failed to disclose an unobvious advance in the art.

The applicant in his response dated July 14, 1975 to the Final Action presented a new set of claims (1 to 9). In that response he stated (in part):

The purpose of the present amendment is to limit the claims down to a preferred embodiment which has special unobvious features over the claims under Final Action. Claim 1 is now limited to a chlorinated or fluorinated hydrocarbon propellant containing up to about four carbon atoms and oxygen, the oxygen having a partial pressure of from about 0.1 lbs. per square inch up to about one-third of the total pressure in the interior of the container. These limitations are fully supported by the disclosure as originally filed and the disclosure changes with this amendment are all for the purpose of limiting it to the invention now claimed.

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Applicant admits that Kriebel, as well as a number of other patents and literature articles, etc., disclose anaerobic compositions. Some of the prior patents also disclose the packaging of a variety of compositions in aerosol form.

Looking first at the question of simple novelty, it will be seen that neither Kriebel or any of the other prior patents suggests the use of anaerobic compositions in aerosol form. There is no suggestion of aerosol packaging techniques extended to anaerobic compositions. The Kriebel patent mentions broad terms such as "container", but at column 2 line 64, et seq., discloses the preferred containers as "preferably a polyethylene or other container which permits the passage of air therethrough". The flow of fresh oxygen through the container walls has long been accepted as an essential feature of storing anaerobic compositions. In actuality, it appears that anaerobic compositions have been used only in low density polyethylene containers since their inception.

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It is particularly surprising that such low levels of oxygen together with the halogenated hydrocarbon propellant are capable of maintaining anaerobic compositions in uncured condition. While the reasons for this are not entirely understood by persons skilled in the anaerobic composition art or in the aerosol packaging art, it is believed that the chlorinated and fluorinated hydrocarbon propellants possess a relatively high oxygen solubility and that as they liquify inside the

aerosol container, they incorporate substantial amounts of oxygen into the liquid phase thereby tending to incorporate and transfer oxygen into the bulk of the anaerobic liquid. It is, therefore, believed by applicants that the propellants may be fulfilling the permeability function of the previously used polyethylene containers for anaerobic compositions.

It is noted that the applicant has stated in his letter of April 8, 1974, that Kriebel as well as a number of other patents disclose anaerobic compositions. Furthermore, the applicant states that the container "may be any suitable container capable of withstanding the super-atmospheric internal pressures required of such systems." (see page 10 of the disclosure.)

The sole question to be considered then is whether the idea or concept (underlying the claimed combination) of packaging an anaerobic composition in aerosol form is inventive.

The merit then of the alleged invention is one where the concept or idea is at the heart of the invention. It is well established in the jurisprudence, however, that the recognition of the concept may well merit patent protection even though the means of realizing the concept are straightforward given the concept. See Electrolux Manufacturing Co. Ltd. v Dominion Manufacturers Ltd (1934) S.C.R. 436 at 442 where Rensselaire J. stated:

The merit of Palloway's patent is not so much in the means of carrying out the idea as in conceiving the idea itself....

The correct approach then is first to decide if the idea or concept (underlying the claimed combination) is new. If it is new, then that idea or concept must be tested for inventiveness. We are also mindful that simplicity does not necessarily suggest that something is unobvious.

It is clear, as far as the facts before us are concerned, that the idea or concept is novel in the sense that the anaerobic composition was not packaged in an aerosol container before the present inventor did it. The general idea of packaging liquids in aerosol containers is of course not novel. The next question to be considered is whether the recognition of the idea or concept merits patent protection.

At the hearing Mr. N. Eades made it clear that "no difficulty had to be overcome to dispense the anaerobic material from an aerosol container." Standard containers, propellants and filling techniques are used.

It was also brought out at the hearing that where the compositions are stored in large vats, air or oxygen is trickled in to maintain the composition in an uncured state. The reason for doing this, of course, is that in the absence of oxygen the composition will solidify. Thus it was known or at least obvious, that the aerosol container for the instant purpose must contain oxygen. The practice of adding oxygen, however, is not new.

The "tube" in an aerosol container is known as a "dip tube." According to Shepherd, supra, this tube is "extruded from special grades or blends or polyethylene...." (see page 136 of Shepherd.)

There was considerable discussion at the hearing about why the composition did not harden in the dip tube while in storage. An essential feature of the previous small containers, in order to prevent hardening, was "the flow of fresh oxygen through the container walls." According to the applicant, in his letter (following the hearing) received June 18, 1976, the oxygen will not flow through the walls of the dip tube as the dip tube walls are essentially non porous. We must remember, however, that the dip tube will be filled with the same liquid composition as is present in the main body of the container. This composition is in the presence of oxygen; the required oxygen having been added to the container under pressure. In our view, to add oxygen in this manner is equivalent to, or serves the same purpose as the trickle charge arrangement mentioned above.

In any case it is well known that the solubility of gases in liquids is increased considerably if the gases are under pressure. HENERY'S LAW states that "the mass of gas dissolved by a given volume of solvent, at constant temperature, is proportional to the pressure of the gas with which it is in

equilibrium." (see the 2nd. edition of the - Textbook of Physical Chemistry - by D. VAN NORTRAND.) Consequently, since it was previously known that oxygen would dissolve in the anaerobic compositions (amides) used in this invention, it is equally apparent that if the oxygen is put under pressure, as it is in aerosol containers, its solubility in the anaerobic amides would be increased considerably. It would, indeed, be anticipated that it would be dissolved in sufficient quantities to prevent setting of the amides. In our view, all that the applicant has done is verify that this is so.

The problem encountered with paint aerosol dispensers was also discussed at the hearing. It is common knowledge that paint hardens in the presence of oxygen, whereas in the instant application the opposite condition is present. The problem however, of preventing the anaerobic composition from hardening - by adding oxygen, was known and understood for a long time.

We find the Shepherd citation useful as showing the advanced state of the art, and we think it apposite to quote from it. Page 528 reads:

Aerosols for industrial use must give excellent performance, in rigid economic terms. While convenience and even novelty may play a part in their acceptance, primarily these products must be able to do the claimed job at a cost quite close to that of the conventionally packaged product. Furthermore, the industrial aerosol is sold to a clientele more likely to examine its performance objectively and critically.

For the most part, industrial pressurized products are designed to meet a very specific industrial need. Very often, this will be a need on the part of the individual workman doing work on a small scale. Where large-scale work is required, the size limitations and the extra cost of the pressurized form rule it out.

Within these general guides, many products have been developed which have a fair volume sold to a specific and specialized market. Among the earliest of the industrial aerosols were the spray belt dressings, which are simply pressurized forms of the conventional product. Although costs of the pressurized products are higher than the conventional "stick and bucket" dressings, the greater mobility and convenience of the former have assured their acceptance.

The task for formulating for specific purposes is well exemplified by pressurized mold release sprays. Several types are available, including those based upon silicones (used specifically in the injection molding field, for example) and upon zinc stearate powder. The latter are noteworthy as having been the first commercially successful aerosol in powder form (an earlier dry graphite product was not considered an aerosol).

An industrial product of interest is cutting oil, based upon heavy oils, to which small amounts of sulfur and chlorine are added. These oils serve to prevent the welding of the metal chips onto the cutting tool. They have proven extremely useful for machinists on small work and for field jobs. Furthermore, they have considerable potential in the very large home workshop market.

Lubricants and rust preventives present another important type of industrial aerosol. These include products based upon the hydrocarbon oils and, in some cases, hydrocarbon-soluble detergents. Many are tailored for more specific end uses and may include graphite (for lubrication where metal-to-metal surfaces are involved) or molybdenum salts. Some products in this class are also sold for the household market.

While most industrial aerosols are designed for specific industries or specific end uses, some have found wide use throughout business. Stencil inks may be considered typical of such. Generally, they are made from resinous inks which are dispersed in acetone. Their use is particularly valuable in field work and wherever small or intermittent needs for stencil inks exist.

It is clear from the above, and other parts of Shepherd's book, that hundreds of liquids, and even some solids, have been dispensed using aerosols. Some of them entail special problems in storage and dispensing from the container. It is but expected that those concerned with aerosols will apply their knowledge to make their wares useable.

It has been said that the inventors were surprised that their device worked so well. We must remember however that they were working outside their normal specialty, and what was surprising to them is not relevant to what those skilled in this specialty would know.

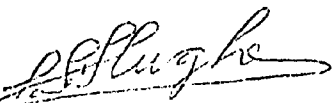
The applicant has argued and submitted evidence that the present method of packaging has resulted in a "longer shelf life." In the present state of aerosol technology (see Shepherd, supra) practitioners are expected to do a reasonable amount of experimentation to arrive at the best and most efficient applications of their technology.

Under such circumstances to simply suggest trying another substance for suitability in an aerosol package whether it be paint, clear plastic or an anaerobic composition does not, in our view, involve an inventive step.

The comments of the court, in Lowe Martin Co. Ltd. v Office Specialty Manufacturing Co. Ltd. (1930) Ex. C.R. 181, are pertinent: "The mere carrying forward of the original thought, a change only in form, proportion or degree, doing the same thing in the same way, by substantially the same means, with better results is not such an invention as will sustain a patent" (page 187 line 9). And "It is always necessary to consider the rights of the general public to avoid monopolies on such simple devices as would occur to anyone familiar with the art." (underlining added.)

We are satisfied that the idea or concept underlying the claimed combination fails to disclose a patentable advance in the art. The applicant has produced a result from an original thought by substantially the same means as is taught in the prior art. (Vide, Lowe Martin v O.S.M. supra)

We recommend that the decisions in the Final Action to refuse the application be affirmed.



J.F. Hughes
Assistant Chairman
Patent Appeal Board

I agree with the recommendation of the Patent Appeal Board. Accordingly, I refuse to grant a patent on this application. The applicant has six months within which to appeal this decision under the provisions of Section 44 of the Patent Act.



J.A. Brown
Acting Commissioner of Patents

Dated at Hull, Quebec
this 13th day of July, 1976

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