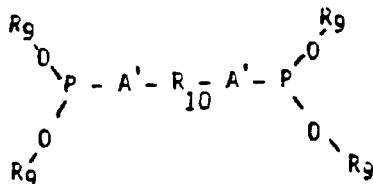


Patentability of claims, cited art:

Claims 1 to 6, and 8 to 13 were found to be unacceptable in view of cited art, while claim 7 is combined with claim 5 would be acceptable. Rejection modified.

This decision deals with Applicant's request for review by the Commissioner of Patents of the Final Action on application 390,454 (Class 400-5046), filed November 19, 1981, entitled PROCESSING OF HEAT STABILIZED POLYARYLATES. It is assigned to Union Carbide Corp. The inventors are H.C. Gardner, M. Matzner, and L.M. Robeson. The Examiner in charge issued a Final Action on November 7, 1984 refusing to allow claims 1 to 13.

The application relates to a molding composition comprising a blend of polyaryl ester resin component derived from a dihydric phenol, and diphosphites and/or diphosponites of the formula:



where A' is O or a bond, R₁₀ is an aromatic radical and R₉ is an alkyl or an aromatic radical.

The Examiner rejected claims 1 to 13 in view of the following reference:

Canadian Patent:
989,414 May 18, 1976 Hofer et al

The Canadian patent discloses molding compositions which may be generally a polyester, or a polyethylene terephthalate, mixed with phosphonous acid derivatives.

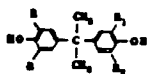
He referred to two additional references as follows:

Japanese Kokai:

Patent Abstracts of Japan, C-14, May 31, 1978, Vol.2, No.72, 749 C 78
53 26 853 March 13, 1978 Sumitomu

Chemical Abstracts, Vol.79, 1973, 116104X
73 51 945 Unitika Co.

The Kokai 53 26 853 relates to a resin composition having improved processability, impact, and heat resistance, made from a styrene resin and a specific polyarylene ester, and is shown by the formula



In the Chemical Abstracts, Kokai 73 51 945 refers to Bisphenol A polyester-rubber blends with improved strength and processability, and to a composition consisting of an aromatic polyester.

In the Final Action the Examiner said, in part, as follows:

...

The patentee's molding compositions can consist of a polyester (in general) disclosed at page 10 line 18, no distinction being made as to the particular types (ie) species, mixed with a phosphonous acid derivative heat, light and oxygen stabilizer (claims 20 and 21). Those diphosponites of the general formula in claim 1 correspond with those of applicant's claim 1 where A' is a bond and R₁₀ is an aromatic radical.

In the patent at page 11 line 15 polyethylene terephthalate was the only species mentioned, but that does not preclude others, such as applicant's polyarylates, from being included under the general term of "polyesters", since these were already known years before, by those skilled in the art....

...

It is deemed that one skilled in the art would have no trouble in carrying out applicant's alleged invention when it comes to stabilizing these particular polyarylates with the same diphosponites which were already known to be useful for the same purpose. The reference does not require a choice to be made from too many variables. The solution is simple and straightforward. The results are to be expected

...

The Applicant responded to the Final Action, in part, as follows:

...

... The instant claims are directed to a composition comprising a blend of a polyprylate (sic: polyarylate) and a stabilizing amount of

a particular diphosphite and/or diphosponite. The data in Tables I and II shows that a definite color stabilization is achieved by using the stabilizers of this invention. Also, the samples do not foam when the stabilizer of this invention is included.

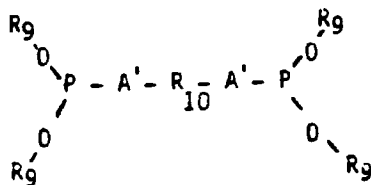
The reference to Hofer et al is directed to the use of phosphonous and thiophosphonous acid ethers as stabilizers for a host of organic materials which includes polyesters. However, it is considered that the term "polyester" would not lead one skilled in the art to a polyarylate and further to the use of diphosponites and/or diphosphites to stabilize the polyarylate and also to the unexpected advantages that the stabilizer achieves, i.e., improvement in color and lack of foaming. One skilled in the art would have to pick specific members of the reference compounds in order to attain the stabilizer of this invention. It is considered that the particular composition of this invention would not be obvious from the reference, since one skilled in the art would have to choose too many variables from the reference to attain the compositions of this invention and it is only speculation that such choices would lead to a polyarylate with better color and no foaming.

...

The issue before the Board is whether or not the subject matter of claims 1 to 13 is patentable in view of the cited art. Claim 1 reads:

A molding composition comprising a blend of:

- (a) a polyarylate derived from a dihydric phenol and an aromatic dicarboxylic acid, and
- (b) a stabilizing amount of diphosphite and/or diphosponite of the following formula:



wherein A' is O or a bond; R₁₀ is an aromatic radical and the R₉'s are independently alkyl or aromatic radicals.

It is said in the application that the addition of a particular diphosphite and/or diphosponite to polyarylates obtains improved thermal and oxidative stability. It is also noted that at the high processing temperatures, e.g. about 400°C, that are present in injection molding, the polyarylates tend to yellow. The Applicant describes how to minimize such yellowing by stabilizing the polyarylate. To this end, diphosphites and/or diphosponites of a given general formula, which is stated in the disclosure and claim 1, are added to the polyarylates. Other preferred formulae for the diphosphites and/or diphosponites are included in the application, as well as in some of claims 2 to 13, all dependent on claim 1.

In the Hofer et al (Hofer) patent, a formula I is given which is similar to the Applicant's formula. We see the Applicant's disclosure, as it pertains to his aromatic radical, encompasses Hofer's aromatic radical when x includes O, or S. In Hofer Y₁ to Y₄ signifies O, or S, whereas the Applicant has placed O in that position. In Hofer R₁ to R₄ signifies an hydrogen or an hydrocarbon radical consisting of at least one aromatic and/or saturated aliphatic and/or alicyclic units, whereas the Applicant has used alkyl or aromatic radicals. The rings A and B in Hofer may be further unsubstituted or each further substituted by 1 or 2 alkyl groups.

The Applicant argues that his claimed composition of a blend of polyarylate and a stabilizing amount of diphosphite and/or diphosphonite produce a definite color stabilization with no foaming at temperatures of 325° and 375°C, and he refers to Tables I and II in the application. We find claim 1 is couched in broad terms and is covered by Hofer. Hofer makes a general reference to polyester, to use of a stabilizer with textiles of polyethylene terephthalate and cellulose fibers, and to good stabilization at about 220°C in polyalkylenes notably polypropylene. Many kinds of material and amounts are described in Hofer and some of these may be compared to the components in claim 1 of the application. For example, Hofer discloses an aromatic radical (R₁₀ in the Applicant's claim 1), the element A' being a bond (A' is O or a bond in the Applicant's claim 1), and alkyl or aromatic radicals for R₁ to R₄ (R₉ is an alkyl or an aromatic radical in the same position in the Applicant's claim 1). In view of this teaching, we are satisfied that the Applicant's claims 1 to 4 do not distinguish patentably from the subject matter of Hofer.

In comparing the Hofer patent to the Applicant's claim 5, we note Hofer discloses a direct bond between the aromatic radical and the phosphorus atom (A' is either O or a bond in claim 5), and describes the elements CH₂, S, and O for X (S, SO₂, O, CO and others for A" in claim 5). For these reasons, the Applicant's claim 5 does not clearly define over the structure shown by Hofer, and therefore, per se is unpatentable. The Applicant's claims 6 and 8, as dependent on claim 5, do not contain any features that

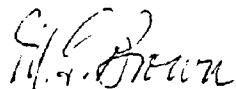
distinguish over the cited art.

We see, however, when the feature of the Applicant's dependent claim 7 is added to the subject matter of claim 5, a different subject matter is obtained from that of Hofer, and may be patentable for the following reason. The hydroxyl substituted hydrocarbon radical present in claim 7 does not appear in any of the cited art. Therefore, a claim combining all the features of claims 5 and 7 represents a patentable advance over the cited art.

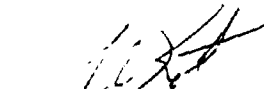
With respect to the Applicant's claim 9, we think the features relating to SO₂ and the hydroxyl grouping for R₁₄ may be patentable in that they are not disclosed by the cited art. However, insofar as claim 9 includes elements disclosed by the cited art, it is not acceptable.

Claims 10 to 13 as they depend on the non-patentable features of claim 1, are not acceptable.

We recommend that the rejection of claims 1 to 13 for not being patentable in view of the cited art be affirmed for claims 1 to 6, and 8 to 13, and withdrawn for claim 7.




M.G. Brown
Acting Chairman
Patent Appeal Board



S.D. Kot
Member

I concur with the findings and the recommendation of the Patent Appeal Board. Accordingly, I refuse to grant a patent containing claims 1 to 6, and 8 to 13, and I withdraw the refusal of claim 7. The applicant has six months to appeal my decision, under Section 44 of the Act.



J.H.A. Gariépy
Commissioner of Patents

Dated at Hull, Quebec
this 20th day of September

1988

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