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Brannon Sowers & Cracraft PC
1 North Pennsylvania Street
Suite 800
Indianapolis, IN 46204

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte*<sup>1</sup> HASSO VONBLCHER and BERTRAM BHRINGER

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Appeal 2016-003595  
Application 12/811,618  
Technology Center 1700

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Before CHUNG K. PAK, JULIA HEANEY, and JANE E. INGLESE,  
*Administrative Patent Judges.*

PAK, *Administrative Patent Judge.*

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134(a) from the Examiner's decision<sup>2</sup> finally rejecting claims 16, 18–20, 23, 24, 27, 28, and 32–35, which are all of the claims pending in the above-identified application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> Appellants identify the real party in interest as “Blucher GmbH, a corporation of Germany[.]” Appeal Brief filed August 26, 2015 (“App. Br.”) at 3.

<sup>2</sup> Final Action entered March 3, 2015 (“Final Act.”) at 2–6; Advisory Action entered June 1, 2015 (“Adv. Act.”) at 2; and the Examiner's Answer entered January 26, 2016 (“Ans.”) at 3–7.

STATEMENT OF THE CASE

The subject matter of the claims on appeal relates to “a functional protective material, more particularly having protective functions with regard to chemical and/or biological poisons and/or noxiants, having a multilayered construction and containing a membrane having reactive additization.” Substitute Specification filed July 2, 2010 (“Spec.”) at 1, ll. 15–18. This functional protective material is useful “in the manufacture of protective materials of any kind (such as, for example, protective suits, protective gloves, protective shoes and other protective apparel pieces and also protective covers, for example for medical transports, tents, sleeping bags and the like)[,]” which are suitable for the military and/or civil sectors. Spec. 1, ll. 19–29.

Details of the appealed subject matter are recited in representative claims 16 and 34,<sup>3</sup> which are reproduced below from the Claims Appendix of the Appeal Brief:

16. A functional protective material having protective function with regard to chemical and biological poisons and noxiants,

Wherein said functional protective material comprises a multilayered construction, said multilayered construction including

- a sheetlike textile supporting material;

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<sup>3</sup> Appellants only argue common limitations in independent claims 16, 32, and 35. App. Br. 15–39. Although independent claim 34 has some of the common limitations recited in independent claims 16, 32, and 35, it is the broadest claim on appeal because it does not require the specific amount of reactive additization recited in independent claims 16, 32, and 35. *Id.* Therefore, for purposes of this appeal, we select claims 16 and 34 as representative of the claims on appeal and decide the merits of the Examiner’s § 103 rejection of record. 37 C.F.R. § 41.37(c)(1)(iv) (2012).

Wherein said supporting material is a woven fabric a loop-formingly knitted fabric, a loop-drawingly knitted fabric, a nonwoven scrim, a batt or a bonded textile fabric and;

- a membrane associated to said supporting material,

wherein said membrane is bonded to said supporting material at least essentially uniformly, or

wherein said membrane is bonded to said supporting material sectionally,

wherein said membrane is endowed with a reactive additization in the form of a catalytically active component having reactivity with regard to chemical and biological poisons and noxiants,

wherein the catalytically active component comprises at least two of the metals from the group consisting of copper, silver, zinc, molybdenum and their compounds, together with at least one of the group consisting of triethylenediamine (TEDA), an organic acid, sulfuric acid and sulfuric acid salts,

wherein the amount reactive additization, based on said membrane, is in the range from  $0.1 \cdot 10^{-4} \%$  to 20 % by weight, and

wherein said membrane is endowed with said catalytically active component after the production of the membrane wherein the endowing of said membrane with said catalytically active component is effected by means of one of plasma-chemically, sputtering, wet-chemically, spraying, vapor deposition and gas phase deposition, or

wherein said membrane includes a polymer matrix and is endowed with said catalytically active component during the production of the membrane, wherein the endowing of said membrane with said catalytically active component is effected by means of interpolymerization or incorporation in the polymer matrix of said membrane, and

wherein the protective material further includes an adsorption layer based on an adsorption material adsorbing chemical and biological poisons and noxiants,

wherein said adsorption material of said adsorption layer is a material based on activated carbon.

34. A functional protective material having protective function with regard to chemical and biological poisons and noxiants,

wherein said functional protective material comprises a multilayered construction, said multilayered construction including

- a sheetlike textile supporting material;

wherein said supporting material is a woven fabric, a loop-formingly knitted fabric, a loop-drawingly knitted fabric, a nonwoven scrim, a batt or a bonded textile fabric and;

- a membrane associated to said supporting material,

wherein said membrane is bonded to said supporting material at least essentially uniformly, or

wherein said membrane is bonded to said supporting material sectionally,

wherein said membrane is endowed with a reactive additization in the form of a catalytically active component having reactivity with regard to chemical and biological poisons and noxiants,

wherein the catalytically active component comprises at least two of the metals from the group consisting of copper, silver, zinc, molybdenum and their compounds, together with at least one of the group consisting of triethylenediamine (TEDA), and organic acid, sulfuric acid and sulfuric acid salts, and

wherein the protective material further includes an adsorption layer based on an adsorption material adsorbing chemical and biological poisons and noxiants, and

wherein said adsorption material of said adsorption layer is a material based on activated carbon.

App. Br. 41, 42, 47, and 48, Claims Appendix.

The Examiner maintains, and Appellants seek review of, the rejection of claims 16, 18–20, 23, 24, 27, 28, and 32–35 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Fish (US 7,794,737 B2 published September 14, 2010), Doughty (US 5,492,882 published February 20, 1996), and Bohringer (2007/0181001 A1 published August 9, 2007). Final Act. 2–10;

Advisory Act. 1–2; Ans. 3–14; App. Br. 14; and the Reply Brief filed February 26, 2016 (“Reply Br.”) at 1–23.

### DISCUSSION

Upon consideration of the evidence relied upon by the Examiner and Appellants in light of each of Appellants’ contentions,<sup>4</sup> we affirm the Examiner’s rejection of claims 16, 18–20, 23, 24, 27, 28, and 32–35 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Fish, Doughty, and Bohringer substantially for the reasons set forth in the Final Action, Advisory Action, and the Answer. We add the following primarily for emphasis and completeness.

The Examiner finds, and Appellants do not dispute, that Fish discloses a protective material, such as a face mask, made of a multilayered construction comprising a woven fabric supporting material and a membrane endowed with, inter alia, zinc oxide nanoparticles and copper oxide nanoparticles bonded to the woven fabric supporting material. *Compare* Final Act. 2–3, *with* App. Br. 15–40; *see also* Fish, col. 5, ll. 22–24 (“a laminate of breathable films<sup>5</sup> [corresponding to

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<sup>4</sup> Any new arguments raised in the Reply Brief, which could have been raised in the Appeal Brief, will not be considered. 37 C.F.R. § 41.37(c)(1)(iv) (“Except as provided for in §§ 41.41, 41.47 and 41.52, any arguments or authorities not included in the appeal brief will be refused consideration by the Board for purposes of the present appeal.”); *see also Ex parte Borden*, 93 USPQ2d 1473, 1474 (BPAI 2010) (Informative) (explaining that under the previous rules, which are similar to the current rules, “the reply brief [is not] an opportunity to make arguments that could have been made in the principal brief on appeal to rebut the Examiner’s rejections, but were not.”).

<sup>5</sup> According to column 2, lines 2–23, of Fish, “this invention is useful in removing gaseous compounds and/or odorous compounds. While the invention will be described hereinafter with particular reference to nanoparticles, it will be understood that the invention is useful with various nanoparticles. ‘Gaseous compound’ or ‘gas’ includes any molecule or compound that can exist as a gas or

the recited membrane] and nonwoven fabrics[,] provided the film contains odor absorbing, nanoparticles....Multilayer laminates generally may have a number of nonwoven layers in many different configurations and may include other materials like film.”), col. 6, ll. 63–67 (“Nanoparticles useful in this invention include silica, alumina, magnesium oxide, titanium dioxide, iron oxide, gold, zinc oxide, copper oxide...combinations thereof.”), and col. 11, ll. 31–36 (“Breathable films and laminates thereof having odor absorbing, nanoparticles are suitable for use in many commercial articles, like for example,...in medical applications like face masks and drapes.”). This multilayered construction, according to column 1, lines 5–10, column 2, lines 10–23, and column 5, lines 3–29 of Fish, is useful for neutralizing, absorbing, and/or removing gases causing a negative effect<sup>6</sup> and odorous compounds or gases, including, but not limited to, ammonia, methyl mercaptan (sulfur compound), and sulfides.

The Examiner acknowledges that Fish does not disclose (1) endowing its membrane with at least one of the group consisting of triethylenediamine (TEDA), an organic acid, sulfuric acid, and sulfuric acid salt, in addition to at least two of the metals from copper, silver, zinc, molybdenum, and their compounds, and (2) employing an adsorption layer based on activated carbon for adsorbing chemical and biological poisons and noxiants as recited in claims 16 and 34. Final Act. 3. To account for these missing features, the Examiner relies upon the disclosures of Doughty and Bohringer. *Id.*

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vapor....Extrudate includes films....The term ‘film’ ...means a breathable film such as, for example, microporous films....”

<sup>6</sup> Notwithstanding Appellants’ arguments to the contrary at pages 21, 23, and 26 of the Appeal Brief, Fish does not limit its gases causing a negative effect to ethylene gas or limit its protective articles to diapers.

The Examiner correctly finds that in context of forming face masks, “Doughty discloses...that the addition of sulfates provides adsorption capacity beyond that provided by just zinc oxide and copper oxides [for removing toxic gases, such sulfides (H<sub>2</sub>S), ammonia (NH<sub>3</sub>), etc.] .... [and] that a combination of zinc oxide, copper oxide, and zinc and/or copper sulfates [(corresponding to the recited sulfuric acid salt)] can provide effective universal filtering of multiple agent types....” *Id* at 3, citing Doughty in its entirety, including col. 4, ll. 37–60; *see also* Doughty, col. 1, ll. 25–27 (“useful in cleaning breathing air or exhaust gases by removing various noxious agents, and may be used in gas mask filters....”) and col. 5, ll. 55–67 (referring to applications in a respirator gas mask, collective protection device or similar applications). Although Doughty prefers including such oxides and sulfates in an activated carbon substrate as pointed out by Appellants, it broadly mentions including such oxides and sulfates in a porous substrate. In the words of Doughty (col. 4, ll. 14–47) (emphasis added):

The present invention generally comprises *a porous substrate* onto which has been deposited various metal compounds (i.e., copper, zinc and molybdenum in the forms of carbonates, oxides and sulfates) which are capable of sorption of *a number of toxic gases* as contaminants in various air mixtures.

The substrate may be impregnated so as to contain, in combination, zinc carbonate (or oxide), copper carbonate (or oxide), zinc (or copper) sulfate and a molybdenum (VI) oxide moiety. The resulting homogeneous composite media can be adapted to give balanced properties which simultaneously satisfy the filter requirements containing Types A, B, E and K gases. Importantly, the chromium-free universal carbons of the present invention possess desirable sorptive capacities and service lives for each toxic agent, and can be manufactured and implemented as a single-stage filter media for multi-range protection.

*Embodiments of the present invention have been found to*



*be effective for removing, neutralizing and/or scavenging various toxic agents including, but not limited to, HCN, H<sub>2</sub>S, Cl<sub>2</sub>, SO<sub>2</sub> and NH<sub>3</sub>, as well as for providing the desired capacity for the physisorption of organic vapors including that of CCl<sub>4</sub>.*

*Within this media, the components of zinc is carbonate (or oxide) and copper carbonate (or oxide), alone and in combinations thereof, serve primarily to remove or effectively isolate acid gas species. Sulfates of zinc or copper are used as impregnates or are formed in situ so as to substantially enhance the ability of the media to adsorb ammonia. The addition of sulfates provides adsorption capacity beyond that provided by the zinc carbonate (or oxide) and copper carbonate (or oxide) manfix which, by itself, contributes minimally toward the later sorptive process.<sup>7</sup>*

Moreover, Bohringer teaches against using activated carbon as a porous substrate onto which various metal compounds are deposited (impregnated) and recommends using an adsorptive layer based on activated carbon, without the metal compounds, as part of a multilayered construction that also includes a top layer made of a nonwoven material and an intermediate layer comprising catalytically active metal compounds. Final Act. 3; *see* Bohringer ¶¶ 6, 12, 13, 14, 28, and 29. Bohringer also teaches that the metal compounds, such as copper, silver, and zinc, their ions and their salts for adsorbing toxic and odorous gases, taught by Fish and Doughty, also function as “a catalytic active component having a biostatic and/or biocidal effect, in particular, a bacteriostatic or bactericidal and/or virustatic or virucidal and/or fungistatic or fungicidal effect.” *See* Bohringer ¶¶ 31 and 32. Bohringer further teaches that the top nonwoven and intermediate layers of its multilayered construction for removing,

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<sup>7</sup> Doughty also mentions including triethylenediamine (TEDA) to further provide cyanogen chloride protection. Doughty, col. 5, ll. 15–26.

neutralizing, and/or adsorbing noxious, odorant and toxicant materials of any kind, may be made of the same materials (polyolefin, polyurethane, or polyester) used to form the nonwoven and film (membrane) layers taught by Fish and that the metal compounds, such as copper, silver, and zinc, their ions and their salts for adsorbing toxic and odorous gases, can be used with a layer made of such materials. *Compare* Bohringer ¶¶ 11, 12, 28, and 35–39, *with* Fish, col. 3, ll. 35–39 and col. 4, ll. 1–14. According to paragraphs 55 and 56 of Bohringer, this multilayered adsorptive filtering material may be used for “protective materials of any kind” “for the civil or military sector,” including “protective headgear and the like and of protective covers of any kind” “for removing noxious, odorant and toxicant materials of any kind, in particular from air and/or gas streams, such as NBC protective mask filters, odour filters, sheet filters, air filters, in particular filters for indoor air cleaning, adsorption-capable supporting structures and filters for the medical sector.”

Under these circumstances, notwithstanding Appellants’ arguments to the contrary, we find no harmful error in the Examiner’s determination that the collective teachings of Fish, Doughty, and Bohringer would have led one of ordinary skill in the art to employ a multilayered construction comprising a nonwoven fabric layer, a porous film (membrane) or textile fabric comprising *adsorbent/catalytic components* (e.g., zinc oxide, copper oxide and sulfates of zinc or copper), and an adsorbent layer based on activated carbon for making masks in medical applications as recited in claims 16 and 34, with a reasonable expectation of not only successfully removing, neutralizing and/or adsorbing noxious, odorants and toxicant substances, such as ammonia (NH<sub>3</sub>) and sulfides (e.g., H<sub>2</sub>S), but also successfully

removing, neutralizing and/or adsorbing other toxicant substances, such as HCN, Cl<sub>2</sub>, SO<sub>2</sub> and organic vapors including that of CCl<sub>4</sub>, as well as biological poisons and noxiants.

Appellants contend that Fish does not mention using the materials to remove, neutralize, and/or adsorb chemical and biological poisons. App. Br. 15 and 23. In so contending, Appellants ignore the collective teachings of Fish, Doughty, and Bohringer. *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.”). As indicated *supra*, Doughty and Bohringer teach that the materials used by Fish are also useful for removing, neutralizing, and/or adsorbing chemical and biological poisons, in addition to removing ammonia and sulfides, which are also known as odorous and toxic substances.

Appellants contend that Doughty teaches an activated carbon adsorbent impregnated with metal compounds, rather than a membrane containing metal compounds that remove, neutralize and/or adsorb chemical and biological poisons. App. Br. 16 and 21. In so contending, Appellants again ignore the collective teachings of Fish, Doughty, and Bohringer. *In re Merck & Co.*, 800 F.2d at 1097. As indicated *supra*, Doughty teaches using sulfates of zinc or copper, in addition to the zinc oxide and copper oxide used in the membrane (porous substrate) of Fish, in its porous substrate (including a porous activated carbon substrate) to not only more effectively remove, neutralize and/or adsorb the specific gases taught by Fish, but also remove, neutralize and/or adsorb other toxicants such as HCN, Cl<sub>2</sub>, SO<sub>2</sub> and organic vapors including that of CCl<sub>4</sub>, some of which are used by military

(in its nerve gas), industries, and medical communities *See also* Doughty, col.1, ll. 37–38. Although Doughty prefers including such oxides and sulfates in a porous activated carbon substrate as pointed out by Appellants, Bohringer teaches against impregnating metal compounds in the porous activated carbon substrate and recommends using an adsorptive layer based on activated carbon, without the metal compounds, as part of a multilayered construction that also includes a top layer made of a nonwoven material and an intermediate layer comprising catalytically active metal compounds as indicated *supra*. Bohringer also teaches that the metal compounds, such as copper, silver, and zinc, their ions and their salts for adsorbing toxic and odorous gases, taught by Fish and Doughty, also function as a catalytic component for removing or neutralizing chemical and biological poisons and can be used with a layer made of the same materials (polyolefin, polyurethane, or polyester) used to form the film (porous membrane substrate) layers taught by Fish as indicated *supra*.

Appellants appear to contend that Doughty does not suggest using the amount of the metal compounds recited in independent claim 16, 32, and 35. App. Br. 25. However, as the Examiner correctly finds, Doughty discloses that the metal compounds can be used in the amount recited in a porous substrate for the purpose of removing, neutralizing and/or adsorbing odorants and toxicants such as ammonia (NH<sub>3</sub>), H<sub>2</sub>S, HCN, Cl<sub>2</sub>, SO<sub>2</sub>, and organic vapors including that of CCl<sub>4</sub>. Final Act. 5, citing Doughty, col. 5, ll. 14–55. Doughty also teaches that “[t]hese formulations [of the metal compounds] may be varied depending on the particular application and/or performance characteristics desired.” Doughty, col. 5, ll. 23–25. Moreover, both Fish and Bohringer teach using the metal compounds as adsorbents and/or catalysts for the purpose of removing, neutralizing and/or adsorbing

odorants and toxicants and/or chemical and biological poisons and noxiants as indicated *supra* and page 12 of the Answer. Thus, we concur with the Examiner that one of ordinary skill in the art would have been led to employ the desired or optimum amounts of the metal compounds, such as those recited in claims 16, 32, and 35, in the porous substrate (membrane) and/or textile fabric taught by Fish and Bohringer. *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) (“[D]iscovery of an optimum value of a result effective variable...is ordinarily within the skill of the art.”); *In re Applied Materials, Inc.*, 692 F.3d 1289, 1297 (Fed. Cir. 2012) (“A recognition in the prior art that a property is affected by the variable is sufficient to find the variable result-effective.”)

Appellants appear to contend that the material taught by the applied prior art would not inherently provide “the specific[ally] claimed protective function (the ability to react with and degrade a chemical poison or noxiant). App. Br. 27–29. However, as discussed *supra* and at page 12 of the Answer, the collective teachings of Fish, Doughty, and Bohringer would have suggested using the catalytic/absorbent metal compounds and activated carbon adsorbent layer to remove, neutralize and/or adsorb odorants and toxicants and/or chemical and biological poisons and noxiants as required by claims 16 and 34.

Appellants contend that Fish and Doughty are not from analogous arts. App. Br. 29–32. However, we are not persuaded by this contention.

This “analogous art” test raises the question of whether Fish and Doughty are so unrelated to the claimed subject matter that a skilled artisan would not have looked to them in arriving at the claimed subject matter. Under the analogous art test, the Examiner must show that “a reference is either in the field of the applicant’s endeavor or is reasonably pertinent to the problem of which the inventor was concerned [from the judgment of a person

having ordinary skill in the art] in order to rely on [that] reference as a basis for rejection.” *In re Kahn*, 441 F.3d 977, 986–87 (Fed. Cir. 2006). As indicated *supra*, the Specification states that the claimed functional protective material is useful “in the manufacture of protective materials of **any kind** (such as, for example, protective suits, protective gloves, protective shoes and other protective apparel pieces and also protective covers, for example for medical transports, tents, sleeping bags and **the like**)[,]” which are suitable for the military and/or **civil** sectors. Spec. 1, ll. 19–29 (emphasis added). This broad description of the claimed subject matter includes the face masks taught by Fish and Doughty as indicated *supra* and pages 10–11 of the Answer. In other words, we find no error in the Examiner’s finding that Fish and Doughty are from the same field of Appellants’ endeavor.

In any event, as discussed *supra* and page 11 of the Answer, Fish and Doughty are also directed to using the metal compounds and activated carbon in removing, neutralizing, and/or adsorbing odorant, noxiant, and/or toxic substances. Thus, we concur with the Examiner that a person having ordinary skill in the art interested in removing, neutralizing, and/or adsorbing odorant, noxiant, and/or toxic substances would have at least looked to the disclosures of Fish and Doughty. Stated differently, Fish and Doughty are reasonably pertinent to the particular problem of which the inventors were concerned from the perspective or judgement of one of ordinary skill in the art.

Appellants contend that one of ordinary skill in the art would not have had a reasonable expectation of success in removing, neutralizing and/or adsorbing odorants and toxicants, such as ammonia (NH<sub>3</sub>), sulfides (e.g., H<sub>2</sub>S), HCN, Cl<sub>2</sub>, SO<sub>2</sub> and organic vapors including that of CCl<sub>4</sub>, as well as biological poisons and noxiants. App. Br. 32–32. However, as discussed

*supra* and at page 13 of the Answer, the collective teachings of Fish, Doughty, and Bohringer would have provided a reasonable expectation of success. Although Appellants rely on paragraphs 7, 9, 10, 11, and 13 of the McQuigg Declaration of record and paragraphs 6, 8, and 10 of the Bohringer Declaration of record to show that one of ordinary skill in the art would not have had a reasonable expectation of success, they focus on Fish and Doughty individually, rather than viewing the collective teachings of Fish, Doughty, and Bohringer as discussed *supra*. In other words, we find no harmful error in the Examiner's determination in giving little or no weight to the opinions provided in the McQuigg Declaration and the Bohringer Declaration inasmuch as they did not take into consideration the collective teachings of the applied prior art, i.e., the totality of the evidence of record relied upon by the Examiner. *See, e.g., Velandar v. Garner*, 348 F.3d 1359, 1371 (Fed. Cir. 2003) ("In giving more weight to prior publications than to subsequent conclusory statements by experts, the Board acted well within [its] discretion.")

Having considered the evidence relied upon by the Examiner and Appellants anew, we find no error in the Examiner's determination that a preponderance of the evidence weighs in favor of obviousness of the subject matter recited in claims 16, 18–20, 23, 24, 27, 28, and 32–35 within the meaning of 35 U.S.C. § 103(a).

#### ORDER

Upon consideration of the record, and for the reasons given, it is

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ORDERED that the decision of the Examiner to reject claims 16, 18–20, 23, 24, 27, 28, and 32–35 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Fish, Doughty, and Bohringer is AFFIRMED; and

FURTHER ORDERED that no time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED