USPTO Priority Timing Dataset

Author: Kyoungah Noh **Contact:** knoh@albany.edu

---

1) Motivation

Many researchers use application dates as proxies for invention timing, but these often reflect later administrative milestones rather than the onset of invention. This dataset provides standardized patent-level priority dates—cleaned from USPTO records, adjusted for continuation chains, and including foreign priority where available—to measure invention timing more accurately.

2) Scope

- **Data:** USPTO *PatentsView* (downloaded on 2025-09-06).
  - `g_patent.tsv`, `g_application.tsv`, `g_us_rel_doc.tsv`, `g_foreign_priority.tsv`
- **Patent type:** Utility patents only.
- **Window:** Application filing years 1980–2025.
- **Continuation types included:** `us-provisional-application (PRO)`, `continuation (CON)`, `continuation-in-part (CIP)`, `division (DIV)`.

3) What's in the dataset

Unit: Each row is one timeline event for a given `patent_id`.

Variable

- `priority_date` — earliest valid priority claim (YYYY-MM-DD)
- `patent_id` — USPTO patent identifier
- `fam_doc_number` — patent identifier on the timeline (U.S. application no.)
- `fam_doc_type` — one of: `application` (self), `PRO`, `CON`, `CIP`, `DIV`
- `fam_doc_date` — filing date (YYYY-MM-DD)
- `patent_date` — grant date (YYYY-MM-DD)
- `foreign_country_filed` — country of earliest foreign filing, if any (e.g., JP)
- `foreign_filing_date` — earliest foreign filing date, if any (YYYY-MM-DD)
- `family_size` — count of timeline rows in the U.S. application chain (`application` + `PRO/CON/CIP/DIV`); foreign priority excluded

4) How `priority_date` is constructed

We compute three components per patent and take the minimum:

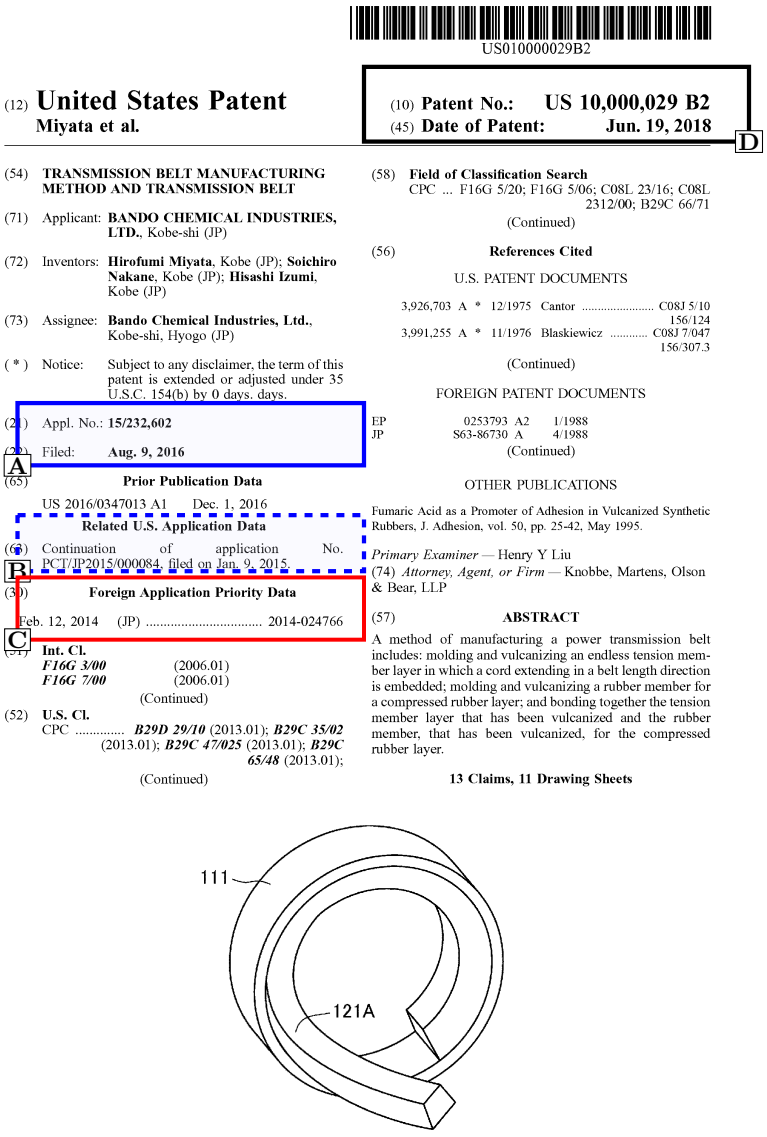
$$\texttt{priority_date} = \min\{\ \texttt{foreign_min},\ \texttt{provisional_min},\ \texttt{us_nonprov_min}\ \}$$

- `foreign_min` — earliest foreign filing (from `g_foreign_priority`)
- `provisional_min` — earliest provisional (from `g_us_rel_doc`)
- `us_nonprov_min` — earliest U.S. non-provisional filing across the patent's chain: {`application`, `continuation`, `continuation-in-part`, `division`}

5) Example (US 10,000,029 B2)

(1) `priority_date` = $\min\{A, B, C\}$ = 2014-02-12 (`foreign_min`)
- Using the application date (2016-08-09) alone ≈ **2.5 years** later than the priority date.

(2) `family_size` = $\text{count}\{A, B\} = 2$ (foreign C not counted).


US010000029B2

(12) **United States Patent**
Miyata et al.

(10) **Patent No.: US 10,000,029 B2**
(45) **Date of Patent: Jun. 19, 2018**

D

(54) **TRANSMISSION BELT MANUFACTURING METHOD AND TRANSMISSION BELT**

(71) Applicant: **BANDO CHEMICAL INDUSTRIES, LTD.**, Kobe-shi (JP)

(72) Inventors: **Hirofumi Miyata**, Kobe (JP); **Soichiro Nakane**, Kobe (JP); **Hisashi Izumi**, Kobe (JP)

(73) Assignee: **Bando Chemical Industries, Ltd.**, Kobe-shi, Hyogo (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. days.

A
(21) Appl. No.: **15/232,602**
(22) Filed: **Aug. 9, 2016**
(65) **Prior Publication Data**
US 2016/0347013 A1 Dec. 1, 2016
Related U.S. Application Data
(63) Continuation of application No. PCT/JP2015/000084, filed on Jan. 9, 2015.
B
(30) **Foreign Application Priority Data**
Feb. 12, 2014 (JP) 2014-024766
C
(51) **Int. Cl.**
F16G 3/00 (2006.01)
F16G 7/00 (2006.01)
(Continued)
(52) **U.S. Cl.**
CPC ***B29D 29/10*** (2013.01); ***B29C 35/02*** (2013.01); ***B29C 47/025*** (2013.01); ***B29C 65/48*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC ... F16G 5/20; F16G 5/06; C08L 23/16; C08L 2312/00; B29C 66/71
(Continued)

(56) **References Cited**
U.S. PATENT DOCUMENTS
3,926,703 A * 12/1975 Cantor C08J 5/10 156/124
3,991,255 A * 11/1976 Blaskiewicz C08J 7/047 156/307.3
(Continued)
FOREIGN PATENT DOCUMENTS
EP 0253793 A2 1/1988
JP S63-86730 A 4/1988
(Continued)
OTHER PUBLICATIONS
Fumaric Acid as a Promoter of Adhesion in Vulcanized Synthetic Rubbers, J. Adhesion, vol. 50, pp. 25-42, May 1995.

Primary Examiner — Henry Y Liu
(74) *Attorney, Agent, or Firm* — Knobbe, Martens, Olson & Bear, LLP

(57) **ABSTRACT**
A method of manufacturing a power transmission belt includes: molding and vulcanizing an endless tension member layer in which a cord extending in a belt length direction is embedded; molding and vulcanizing a rubber member for a compressed rubber layer; and bonding together the tension member layer that has been vulcanized and the rubber member, that has been vulcanized, for the compressed rubber layer.

13 Claims, 11 Drawing Sheets

Figure 1: US 10,000,029 B2

Dataset (simplified):

priority_date	patent_id	fam_doc_number	fam_doc_type	fam_doc_date	foreign_country_filed	foreign_filing_date	family_size
2014-02-12	10000029 (*D*)	PCT/JP2015/000084	continuation	2015-01-09 (*B*)	JP	2014-02-12 (*C*)	2
2014-02-12	10000029	15232602	application	2016-08-09 (*A*)	JP	2014-02-12	2

6) Potential value of this dataset

1. **Unity of invention (project-level analyses)**
   By grouping the focal application and its continuations (CON/CIP/DIV/PRO) under a *single earliest priority date*, researchers can analyze outcomes at the *project* level rather than fragmenting the same inventive effort across multiple filings. This prevents double counting and clarifies what belongs to one underlying invention versus a sequence of administrative extensions. It enables cleaner measurement of project-level outcomes such as forward citation accumulation (e.g., within 3/5/10 years of the priority date), claim growth and narrowing across the chain, grant and continuation depth profiles, maintenance/renewal behavior, and assignment dynamics (e.g., intra-firm transfers, M&A–related reassignments). The unity-of-invention view is particularly valuable when comparing the intensity and trajectory of follow-on filings within a project, distinguishing incremental refinements from the original inventive contribution, and benchmarking invention "size" or "reach" without inflating counts via multiple continuations.

2. **Trend timing comparison (priority vs. application)**
   Counting by *priority date* instead of *application date* makes visible how much later technological activity appears under administrative clocks. Comparing priority-dated and application-dated series allows researchers to quantify systematic lags (e.g., shifts in peak years/quarters, cross-correlation lead/lag, or the distribution of $\Delta t = \text{application} - \text{priority}$). This comparison sharpens detection of emerging fields, reveals earlier inflection points, and reduces false impressions of "slow starts" that are artifacts of filing strategy or processing timelines. It also supports nowcasting exercises (e.g., early signals of growth in a CPC domain) and fairness/coverage checks across fields and assignee types, highlighting domains where application-based counting is especially delayed (e.g., continuation-heavy technologies) and where priority-based signals better track the onset of new ideas.

3. **Link to firm R&D timing (priority-date anchoring)**
   Aligning inventions to firms' fiscal periods using *priority dates* (rather than application dates) connects inventive output to the period when ideas are first crystallized, not when paperwork is completed. This tighter alignment reduces attenuation that arises when administrative lags separate R&D expenditure from measured outputs. It enables analyses of lead–lag dynamics between R&D spend and invention counts or project launches, facilitates comparisons across firms with different continuation practices, and supports richer dashboards that place inventions in the same quarter/year as related internal activities (e.g., research milestones or program kick-offs). Priority-dated alignment is also useful for benchmarking the timing of invention relative to other external indicators (e.g., scientific publications or standards activity), offering a more coherent picture of when firms generate new ideas and how quickly those ideas progress through the formal patenting process.

Taken together, these uses improve the accuracy of invention timing, mitigate count inflation from continuation practice, and provide a transparent basis for benchmarking technologies, firms, and periods. They also create space for robustness checks—e.g., reporting both priority- and application-dated series, or disclosing Δt by field/assignee—so that readers can see how timing assumptions affect substantive conclusions.