

TABLE S8-32

USPTO patents and patent families granted in textile and paper machines, by region, country, or economy: 1998–2018

(Number)

Region, country, or economy	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		
	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families			
World	3,764	7,562	3,760	8,818	4,135	6,785	4,377	6,311	4,280	5,987	4,010	6,199	3,842	6,757	3,070	6,990	3,225	7,359	2,893	7,189	2,992	6,843	2,878	7,287	3,822	8,729	3,891	9,963	3,896	10,329	3,958	10,060	4,348	10,401	3,915	10,754	3,469	12,191	3,155	11,723	3,097	11,456	
North America	1,594	1,514	1,514	1,086	1,608	1,133	1,691	1,128	1,631	1,025	1,537	968	1,471	896	1,113	689	1,091	629	871	498	1,023	492	769	399	1,053	578	1,022	482	1,135	568	1,230	504	1,059	459	1,004	349	948	270	924	224			
Canada	58	44	44	44	53	35	54	43	54	34	42	28	32	20	30	21	41	22	26	19	32	24	27	17	43	27	29	18	45	24	47	18	42	22	43	28	39	20	34	19	25	7	
Mexico	4	2	2	1	2	1	2	1	3	2	1	2	4	3	2	1	1	1	1	1	3	1	1	0	1	0	2	0	3	0	3	1	1	1	1	1	3	1	3	1	3	3	
Puerto Rico	0	0	1	0	0	0	0	0	0	0	2	0	2	0	5	0	5	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0
United States	1,532	1,143	1,468	1,042	1,552	1,097	1,635	1,085	1,574	989	1,491	937	1,434	873	1,075	665	1,044	606	841	478	747	468	740	382	1,008	551	990	464	1,086	544	1,180	486	1,320	586	1,014	430	962	327	909	248	895	214	
All others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Central and South America	5	4	2	1	3	4	5	4	3	1	3	8	4	3	3	5	1	6	3	8	4	6	8	9	10	16	13	4	10	7	9	6	10	7	9	6	12	6	10	6	13		
Argentina	2	2	0	0	0	0	1	1	1	0	1	0	2	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Brazil	2	1	2	1	0	3	3	4	2	1	5	2	3	3	3	5	1	4	3	8	4	6	8	9	12	3	10	9	12	3	9	5	7	9	6	7	5	11	4	13	4	13	
All others	1	1	1	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	1	0	2	1	1	0	2	1	2	2	1	2	1	2	1	1	0	
Europe	993	1,365	968	1,548	1,091	1,460	1,082	1,231	995	1,181	917	1,304	847	1,530	660	1,361	609	1,106	474	1,025	495	953	445	892	585	857	573	870	599	839	600	844	609	754	693	577	677	503	693	562	862	542	833
EU	921	1,147	892	1,351	1,006	1,268	1,003	1,039	932	1,007	852	1,064	801	1,268	617	1,168	560	937	438	825	469	767	415	692	549	696	544	739	566	716	564	679	563	633	540	577	473	600	517	751	503	712	
Austria	31	32	28	41	26	38	28	23	22	36	19	33	22	31	11	20	16	39	9	19	12	26	9	22	13	22	7	22	17	25	20	27	13	20	27	16	24	18	20	11	18	16	23
Belgium	36	16	28	15	66	14	53	17	53	10	34	22	46	23	31	14	39	15	24	19	26	15	23	22	22	9	18	28	23	20	28	15	27	8	23	27	8	18	20	23	20	35	
Denmark	7	6	18	2	11	3	13	3	9	2	10	7	6	2	7	5	6	5	6	6	3	12	4	6	6	2	4	2	2	8	2	5	2	8	7	11	8	9	5	9	5	9	2
Finland	61	84	70	120	58	100	75	91	91	81	65	143	80	108	49	144	44	85	32	68	37	90	28	83	32	78	40	85	37	89	31	46	31	43	33	39	26	60	29	50	24	55	
France	82	133	68	140	68	157	64	139	74	118	70	130	51	144	38	127	49	147	35	110	44	89	30	98	48	102	45	96	50	79	50	72	54	87	54	63	48	73	63	65	52	57	
Germany	477	370	440	388	462	330	471	363	405	359	408	370	381	368	296	466	239	452	199	404	203	321	196	256	284	234	319	239	274	208	279	208	279	192	242	159	240	152	248	149	243		
Hungary	0	0	0	1	0	1	0	2	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	1	0	1	0	1	1	0	0	0	1	1	2	0	1	2	0	1	0	0	1
Ireland	0	15	2	5	1	1	0	0	0	0	1	1	1	2	0	2	1	2	4	2	8	2	3	1	3	2	3	4	1	26	14	7	3	5	6	4	2	13	1	8	0		
Italy	58	221	56	382	85	395	59	147	52	173	54	144	49	360	42	168	47	27	35	22	34	33	36	25	39	50	48	69	39	50	48	69	21	38	17	46	18	51	143	37	121		
Netherlands	22	42	19	33	31	44	28	36	31	26	19	22	34	20	27	34	23	30	13	18	27	18	25	22	39	22	30	17	24	13	34	15	30	14	40	11	38	14	40	17	44	13	
Spain	7	40	15	48	26	41	29	61	31	39	45	69	28	60	31	60	15	52	32	53	14	41	6	43	11	35	20	36	23	43	50	31	49	31	49	35	42	42	33	54	39		
Sweden	45	75	58	83	68	69	78	75	68	85	44	53	47	58	35	47	30	32	34	33	29	27	25	32	28	31	44	24	43	22	32	16	48	9	30	19	22	26	28	32	32	33	
United Kingdom	89	27	91	35	74	28	101	39	93	30	79	28	59	36	54	44	48	18	33	19	29	15	28	18	46	16	39	20	53	45	60	20	63	15	59	17	43	18	49	33	43	20	
All others	5	84	1	57	7	46	3	44	1	46	3	44	4	42	3	44	2	33	2	52	1	75	2	62	6	42	3	28	8	52	6	73	5	82	7	73	9	89	13	69	69		
Other Europe	72	218	76	197	85	192	79	193	64	174	65	240	47	262	42	193	50	169	36	200	26	186	30	200	36	161	29	130	33	123	37	165	45	121	93	45	112	39	45	112	39	121	
Former Soviet Union	0	6	0	6	0	2	0	7	0	9	0	26	0	72	0	21	0	13	0	22	0	16	0	21	0	15	0	12	1	12	0	13	0	12	0	8	1	14	0	9	0	6	
Norway	3	3	2	1	1	2	1	1	1	2	0	2	1	0	1	1	1	2	1	3	0	3	1	2	1	2	0	2	1	1	2	1	2	0	2	1	0	0	0	0	0	0	1
Russia	2	175	2	147	1	137	6	121	2	126	4	168	2	151	1	132	1	110	1	127	1	117	1	145	1	99	1	86	0	122	64	122	85	64	122	61	0	86	0	98	98		
Switzerland	66	34	71	43	83	49	71	63	60	37	58	44	42	39	40	38	48	44	33	47	24	46	28	31	34	28	26	19	28	24	32	26	39	23	33	23	25	15	42	14	33	14	
All others	1	0	1	0	0	3	2	1	1	1	2	0	2	0	1	1	0	0	1	0	0	3	1	2	0	2	0	0	1	1	2	4	1	2	1	2	4	2	2	2	6	2	2
Asia	1,127	4,977	1,242	6,159	1,402	4,156	1,507	3,906	1,541	3,716	1,455	3,891	1,409	4,288	1,156	4,895	1,247	5,572	1,244	5,583	1,338	5,267	1,385	5,925	1,718	7,169	1,836	8,540	2,007	8,868	2,010	8,663	2,292	8,989	2,202	9,568	1,887	11,104	1,581	10,559	1,558	10,368	

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	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families			
China	2	52	2	48	5	98	3	117	5	149	3	205	8	340	8	403	9	500	13	612	10	744	16	1,029	17	1,471	24	2,349	26	2,636	31	2,450	43	3,078	40	4,935	51	6,048	68	5,809	60	5,740	
India	0	1	0	1	1	3	2	2	0	0	3	1	2	1	0	0	1	0	1	2	2	0	2	1	3	2	5	1	4	2	4	3	5	3	6	3	10	2	10	1			
Japan	1,048	4,485	1,158	5,054	1,296	3,562	1,390	3,339	1,393	3,084	1,330	2,931	1,250	3,028	1,030	2,966	1,096	3,258	1,096	3,494	1,182	3,741	1,210	4,325	1,525	4,945	1,661	5,113	1,817	4,990	1,791	4,760	2,094	4,406	2,031	3,516	1,725	4,015	1,383	3,577	1,384	3,381	
Malaysia	1	0	0	0	0	0	0	0	0	1	0	0	1	1	1	3	2	3	1	3	1	2	1	1	5	1	0	5	1	1	2	1	2	0	2	2	0	5	2	2	2		
Singapore	2	6	3	3	3	2	7	5	14	10	14	13	12	6	7	5	10	7	5	7	5	5	2	1	6	2	5	2	9	5	11	9	15	9	9	3	11	6	20	6	21	8	
South Korea	32	366	42	971	53	397	44	317	62	326	47	600	56	732	55	1,366	75	1,597	75	1,236	91	666	96	460	109	584	82	866	95	1,089	95	1,252	69	1,292	65	907	55	823	47	946	43	1,080	
Taiwan	40	66	37	79	42	91	60	123	66	145	57	139	79	177	54	151	57	224	46	224	45	107	58	103	54	160	54	197	53	144	76	186	63	193	50	199	33	206	49	212	35	154	
All others	1	1	0	3	2	3	0	3	1	2	2	1	1	1	1	1	1	1	1	6	1	2	0	4	2	4	7	2	2	1	2	4	6	2	3	3	2	3	1	3	3		
Middle East	12	7	14	5	14	6	17	11	25	8	19	9	18	7	8	5	16	7	10	5	11	6	14	4	18	8	16	10	22	11	31	20	37	19	42	20	48	13	38	8	36	11	
Israel	11	7	13	5	13	2	17	7	24	5	19	6	17	2	6	4	16	6	10	2	11	5	14	4	18	8	16	8	22	10	30	18	35	19	40	17	48	12	37	7	29	8	
All others	1	0	1	1	1	4	0	4	1	3	0	3	1	1	0	1	0	1	0	2	0	1	0	0	0	0	2	1	2	1	2	2	0	2	3	1	2	0	1	6	3		
Africa	1	13	0	7	1	4	1	2	2	11	0	10	2	6	0	19	0	8	1	6	0	7	1	7	0	2	1	3	4	3	2	5	3	4	1	3	1	1	0	1	0	3	
South Africa	1	8	0	4	1	3	1	1	2	1	0	4	2	3	0	16	0	8	1	4	0	2	0	4	0	1	0	0	1	3	0	1	3	0	1	3	0	0	0	0	0	0	0
All others	0	5	0	3	0	1	0	1	1	10	0	6	0	3	0	3	0	0	0	2	0	5	1	3	0	2	0	0	3	0	4	0	3	1	1	1	1	0	1	0	1	0	3
Australia and Oceania	30	5	19	6	17	15	73	26	80	40	79	14	87	26	130	17	258	34	287	68	358	113	259	52	440	100	428	38	129	31	74	14	38	17	25	20	18	20	19	11	32	3	
Australia	26	5	18	5	15	12	71	26	77	40	78	14	86	26	128	17	258	33	287	68	357	113	259	51	437	100	426	38	129	31	74	14	35	17	25	19	17	20	16	9	31	3	
New Zealand	3	0	2	1	2	3	2	0	3	0	1	0	1	0	2	0	0	0	0	0	0	0	0	1	3	0	2	0	0	0	1	0	3	0	0	0	0	1	0	0	0	0	0
All others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unclassified	3	3	1	5	0	8	1	2	1	0	0	0	0	0	0	2	0	3	0	1	0	0	0	0	0	0	0	9	0	0	0	0	0	1	1	0	1	0	0	0	0	0	

EU = European Union; USPTO = U.S. Patent and Trademark Office.

Note(s)

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

Source(s)

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.