

**IP PRAGMATICS**

# **A CHRISTMAS PATENT LANDSCAPE**

**Christmas Inventions Past & Present**

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**Author: Filip Silvestre**

**Sector Lead: Rupert Osborn & Bansil Pattni**

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London | Edinburgh | Sydney

+44 (0) 203 176 0580

[info@ip-pragmatics.com](mailto:info@ip-pragmatics.com)



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## 1 EXECUTIVE SUMMARY

Christmas is a time for friends and family, and for reflecting on the past year. It has also spurred many inventive ideas.

This white paper provides an overview of the Christmas patent landscape, identifying patents and patent applications filed specifically for Christmas related inventions, some more commercially viable than others.

### 1.1 KEY FINDINGS

#### 1.1.1 PATENTING TRENDS

Not unsurprising perhaps, the high number of patents filed over the last 20 years indicates significant commercial interest in inventions aimed specifically at the Christmas market.

The main emerging areas of commercial interest that were identified through the landscape analysis include:

- Artificial Christmas trees
- Christmas tree stands
- Christmas tree decorations
- Light-emitting diodes
- Christmas cards

The landscape analysis also identified several areas experiencing a decrease in patent filings:

- Lighting devices using a string or strip of light sources
- Fastening of light sources or lamp holders

Top emerging areas of innovation relating to Christmas trees include:

- Illuminated decorations
- Decorations that are specially adapted for emitting sound
- Decorations involving motion
- Decorations comprising means for attaching to a lamp or candle holder
- Decorations comprising artificial snow
- Decorations consisting of elongated flexible decorations, e.g. tinsels, garlands, chains
- Tree stands comprising watering means, e.g. a water reservoir
- Tree stands involving electricity
- Tree stands allowing the tree to rotate or vibrate thereon
- Tree stands that are stackable, foldable, collapsible, nestable or sale packaged

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### 1.1.2 KEY MARKETS

The global distribution of patent filings was analysed to identify key markets:

- Most of the Christmas related research appears to be happening in the US, as it has the highest number of priority applications. It is followed by China, Germany, and Japan. The UK is ranked 5<sup>th</sup> on the list.
- China has the highest number of granted patents reflecting its importance as a manufacturing base. Other leading markets include US, Germany, and Europe, with UK ranked 7<sup>th</sup> on this list.

The high number of expired patents shows that creating Christmas inventions is not new. It is also a market where inventive creativity is getting harder, reflected by the low number of pending patent applications.

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### 1.1.3 KEY PLAYERS

The top ten assignees from the patent landscape highlight organisations with the highest patent activity. These key players are mostly commercial companies.

The top three assignees identified in the patent landscape appear to include:

- **Ganzhou Dongfeng Automation Equipment Co Ltd** holds a patent portfolio focused on artificial Christmas trees.
- **Fujian Yinghao Cultural & Creative** has patent filings focused on Christmas tree decorations.
- **Mr Christmas Inc** owns a patent portfolio focused on ornaments and artificial Christmas trees

Other key organisations include Polygroup Macau Ltd Bvi, Beijing Inst Graphic Comm, Shenzhen Gimech Tech Corporation, Hallmark Cards, Zhejiang Sungiant Arts & Crafts Co Ltd, Krinner Innovation GmbH, and Hangzhou Hangfeng Metal Products Co Ltd.

Top UK players include Scalable Designs Ltd, Shining Blick Enterprises Co Ltd, Hugewin Electronics Co Ltd, Packway Industry Ltd, Capricorn Controls Ltd, and Manthorpe Engineering.

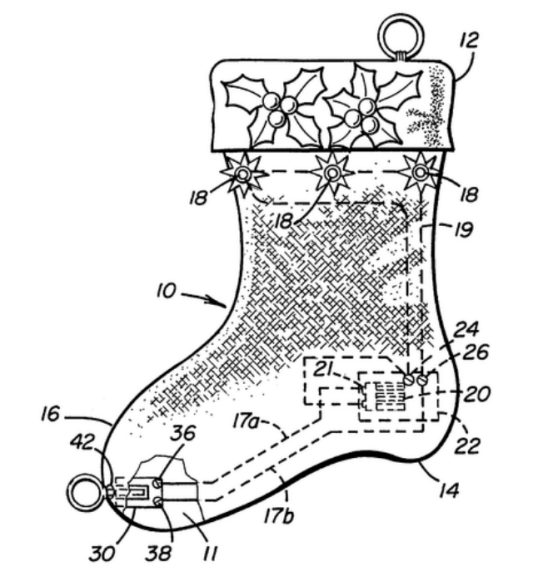
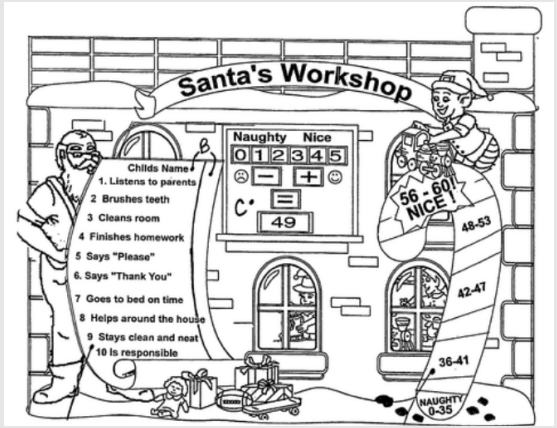
The most well-established players in the field relating to Christmas include:

- **Krinner Innovations** has the most patent filings relating to tree stands.
- **Mr Christmas** owns a patent portfolio focused on ornaments and artificial Christmas trees
- **Hallmark Cards** appears to lead innovation relating to Christmas cards, with significant interest also in Christmas decorations.

The most influential newcomer identified by the patent landscape analysis includes:

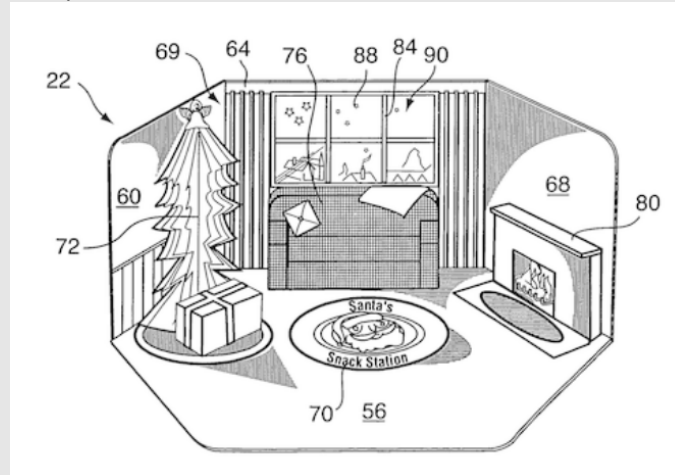
- **Polygroup Macau** appears to have the most diversified patent portfolio, with most patent filings relating to artificial Christmas trees, as well as Christmas tree stands and lights.

## 1.1.4 OUR FAVOURITE INVENTIONS

Publication Number	Title (English)	Assignee	Publication Date
<a href="#">US5523741A</a>	Santa Claus detector	CANE THOMAS	1996-06-04
<b>Summary/Abstract</b> – A children's Christmas Stocking device useful for visually signalling the arrival of Santa Claus by illuminating an externally visible light source having a power source located within said device.			
			
<a href="#">US2008299533A1</a>	Naughty or nice meter	ORSINI FRANK C	2008-12-04
<b>Summary/Abstract</b> – The "Naughty or Nice Meter" is a visual novelty toy designed to let Children know where they stand on a "Naughty or Nice Meter". Originally conceived for Christmas, the "Naughty or Nice Meter" has widespread applications and can be used for other seasons of the year or events. The device has twelve (12) behavioral questions children will be graded on. The grading system for each question is a point scale from zero thru five. Zero (0) being the worst (Naughty) score and five (5) being the best (Nice) score. A calculator is used to add/subtract the total number of points accumulated for all twelve (12) questions. The meter is categorized in five number ranges (0-35; 36-41; 42-47; 48-53; 54-60). Each range signifies a different percentage grade of naughty to nice. The "Meter" lights up/down to the numbered range displayed according to the total number accumulated by the calculator.			
			
<a href="#">US2006046603A1</a>	Santa Claus visit kit	COLAK JOHN I	2006-03-02

Publication Number	Title (English)	Assignee	Publication Date
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**Summary/Abstract** – A kit for creating an illusion that suggests a Santa Claus visit in a premises is disclosed. The kit includes items revealed to a child audience. These items include a displayer at which small items can be placed, and amusement items for use by at least a member of the child audience in carrying out steps that the child audience is invited to believe will assist Santa Claus in making the visit. The kit also includes items at least temporarily concealed from the child audience. The concealed items include means for making boot print resembling marks to mark an illusionary trail of Santa Claus in the premises.



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## 2 PATENT LANDSCAPE

### 2.1 INTRODUCTION

Christmas is an annual festival observed in December as a religious and cultural celebration. During this period, a variety of Christmas decorations are displayed, such as Christmas trees and lights. It is also a time during which gifts are exchanged between family and friends, which attracts significant commercial interest. The purpose of this article is to investigate the patent landscape relating to Christmas technology, in order to help understand how innovation is driving the area.

### 2.2 SEARCH STRATEGY

The following search strategy was drafted utilising key search terms to identify the overall patent landscape for technologies related to Christmas. The search strings were drafted using IP Pragmatics' subscription landscape tool, Derwent Innovation, with additional analysis conducted in Orbit by Questel.

The following document collections were searched:

**Africa** – ARIPO Granted; OAPI Granted; Morocco Granted, Morocco Applications; South Africa Applications; Tunisia Applications.

**Americas** - Argentinean Utility Models; Argentinean Applications; Brazilian Utility Models; Brazilian Granted; Brazilian Applications; Canadian Granted; Canadian Applications; Columbian Applications; Costa Rican Applications; Costa Rican Utility Models; Cuban Applications; Cuban Granted; Mexican Granted; Mexican Applications; Uruguayan Applications; US Granted and US Applications.

**Asia** – Chinese Utility Models; Chinese Granted; Chinese Applications; Eurasian (EAPO) Granted; Gulf Cooperation Council Granted; Indian Granted; Indian Applications; Indonesian Simple; Indonesian Applications; Israeli Granted; Japanese Utility Models; Japanese Granted; Japanese Applications; Korean Utility Models; Korean Granted/Examined; Korean Applications; Malaysian Granted; Singaporean Granted; Singaporean Applications; Thai Granted/Examined; Vietnamese Granted and Vietnamese Applications.

**Europe** - Austrian applications; Austrian Granted; Austrian Utility Models; Belgian Applications; Belgian Granted; Bulgarian Applications: Bulgarian Granted; Bulgarian Utility Models; Croatian Applications; Croatian Granted; Croatian Utility Models; Czechoslovakia Granted; Czech Applications; Czech Granted; Czech Utility Models; Estonian Applications; Estonian Granted; Estonian Utility Models; European Granted; European Applications; Finnish Granted; Finnish Applications; French Granted; French Applications; German Utility Models; German Granted; German Applications; Greek Granted; Greek Applications; Hungarian Granted; Icelandic granted; Irish Applications; Irish Granted; Irish Utility Models; Italian Granted; Latvian Granted; Lithuanian Granted; Luxembourgian Granted; Luxembourgian Applications; Moldavian Granted; Moldavian Utility Models; Monacan Granted; Dutch Applications; Dutch Granted; Norwegian Granted; Norwegian Applications; Polish Granted; Polish Utility Models; Portuguese Applications; Portuguese Granted; Portuguese Utility Models; Romanian Applications; Romanian Granted; Romanian Utility Models; Russian Utility Models; Russian Applications; Serbian applications: Serbian Granted; Serbian Utility Models; Slovakian applications:



Slovakian Granted; Slovakian Utility Models; Slovenian Granted; Slovenian Utility Models; Spanish applications; Spanish Granted; Spanish Utility Models; Swedish applications; Swiss Granted; Swedish applications; Swiss Granted; British Granted and British Applications.

**Oceania** - Australian Granted; Australian Utility Models; Australian Applications, New Zealand Granted.

#### **World** - WIPO (PCT) Applications

Please see the following summary of the search strategy used to search the above collections to investigate the patent landscape. Please note, a “Christmas tree” appears to also refer to an assembly part for an oil well, hence in order to reduce the amount of noise in the generated dataset, the search strategy aims to exclude results relating to petroleum and natural gas extraction, hydraulic engineering and earth drilling.

CTB=(christmas\*) NOT (AIC=(B63\* OR E02\* OR E21\* OR F01\* OR F02\* OR F03\* OR F04\* OR F05\* OR F15\* OR F16\* OR F17\*) OR CTB=((subsea\* OR sea OR underwater\* OR (under ADJ2 water\*) OR oil OR oilwell) NEAR5 (Christmas\* ADJ2 tree)));

The search generated a result set of **12,749 INPADOC families** (18,263 individual cases).

The definition of classifications and search codes utilized in the search strategy can be found in the following table.

*Table 1. Classification definitions.*

IPC	Definition
B63	SHIPS OR OTHER WATERBORNE VESSELS; RELATED EQUIPMENT
E02	HYDRAULIC ENGINEERING; FOUNDATIONS; SOIL SHIFTING
E21	EARTH DRILLING; MINING
F01	MACHINES OR ENGINES IN GENERAL; ENGINE PLANTS IN GENERAL; STEAM ENGINES
F02	COMBUSTION ENGINES; HOT-GAS OR COMBUSTION-PRODUCT ENGINE PLANTS
F03	MACHINES OR ENGINES FOR LIQUIDS; WIND, SPRING, OR WEIGHT MOTORS; PRODUCING MECHANICAL POWER OR A REACTIVE PROPULSIVE THRUST, NOT OTHERWISE PROVIDED FOR
F04	POSITIVE - DISPLACEMENT MACHINES FOR LIQUIDS; PUMPS FOR LIQUIDS OR ELASTIC FLUIDS
F05	INDEXING SCHEMES RELATING TO ENGINES OR PUMPS IN VARIOUS SUBCLASSES OF CLASSES F01-F04
F15	FLUID-PRESSURE ACTUATORS; HYDRAULICS OR PNEUMATICS IN GENERAL
F16	ENGINEERING ELEMENTS AND UNITS; GENERAL MEASURES FOR PRODUCING AND MAINTAINING EFFECTIVE FUNCTIONING OF MACHINES OR INSTALLATIONS; THERMAL INSULATION IN GENERAL
F17	STORING OR DISTRIBUTING GASES OR LIQUIDS



### 2.3.1 CLASSIFICATIONS

The key research areas identified using concept analysis were investigated further using patent classification analysis, which provides additional insights. The International Patent Classification (IPC) provides a hierarchical system of language independent symbols for the classification of patents and utility models according to the different areas of technology to which they pertain. The IPC divides technology into eight sections with approximately 70,000 subdivisions. The appropriate IPC symbols are indicated on each patent document, of which more than 1,000,000 were issued each year in the last 10 years.

In order to verify the relevance of the patents listed, and to look in more detail at the areas of technical focus shown in the landscape map, an analysis of the top 10 current IPC codes was performed (see table below). As mentioned above, IPC codes are a mechanism of categorising the patents by detailed subject matter and have been used in part to frame the search, so there will be some bias towards the top-level codes used in the search in these results.

Each patent is typically classified according to one or a few IPCs as they may cover one or a number of technology fields. The top 10 IPC listing highlights and explains those IPC codes that have most frequently occurred within the patent families listed:

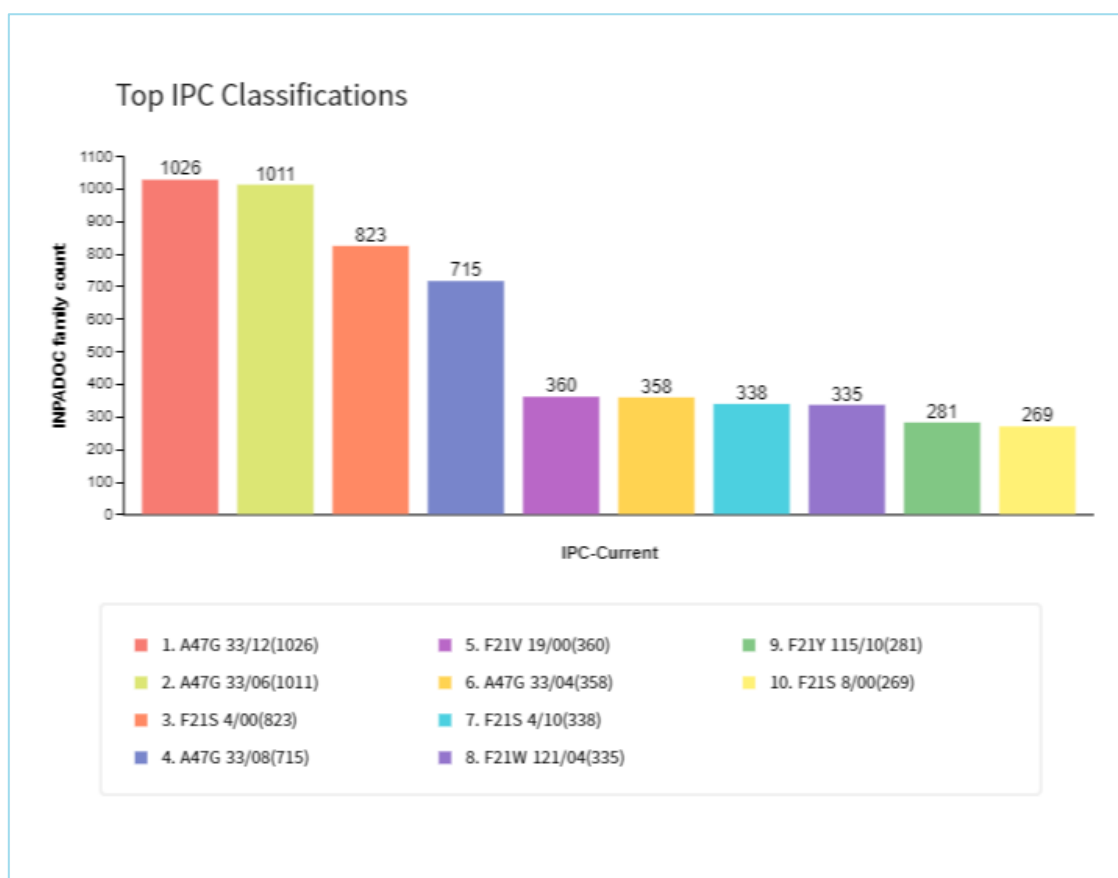


Table 2. Classification definitions.

Rank	IPC	Number of Families	Definition
1	A47G33/12	1026	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees A47G33/12 Christmas tree stands
2	A47G33/06	1011	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees A47G33/06 Artificial Christmas trees
3	F21S4/00	823	F21S4/00 Lighting devices or systems using a string or strip of light sources
4	A47G33/08	715	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees A47G33/08 Christmas tree decorations
5	F21V19/00	360	F21V19/00 Fastening of light sources or lamp holders (
6	A47G33/04	358	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees
7	F21S4/10	338	F21S4/00 Lighting devices or systems using a string or strip of light sources F21S4/10 with light sources attached to loose electric cables, e.g. Christmas tree lights
8	F21W121/04	335	F21W121/00 Use or application of lighting devices or systems for decorative purposes, not provided for in groups F21W121/04 for Christmas trees
9	F21Y115/10	281	F21Y115/00 Light-generating elements of semiconductor light sources F21Y115/10 Light-emitting diodes [LED]
10	F21S8/00	269	F21S8/00 Lighting devices intended for fixed installation

The majority of the top 10 IPCs are within the A47G33/04 classification group which broadly covers the field of Christmas trees. Most of the innovation appears to be focused on Christmas tree stands, artificial Christmas trees, and lighting devices using a string or strip of light sources. The analysis also reveals significant focus on Christmas tree decorations, fastening of light sources or lamp holders, and light-emitting diodes.

### 2.3.2 TECHNOLOGY TRENDS

In order to investigate the landscape further, we used a heatmap to examine how the key technology areas have changed over time.

This analysis shows that the most recent patent filings focus on artificial Christmas trees (A47G33/06), with significant increase also in patent filings relating to Christmas tree stands (A47G33/12) and Christmas tree decorations (A47G33/08).

There appears to also be significantly more interest in lighting devices for Christmas trees (F21W121/04), with most recent patent filings focusing on light-emitting diodes (F21Y115/10). Interestingly, while patent filings relating to light-emitting diode devices appear to be increasing, the analysis shows a significant reduction in patent filings relating to lighting devices on a string (F21S4/00), as well as a decrease in the number of patents filed for fastening means of light sources (F21V19/00).

Table 3. Classification definitions.

IPC	Definition
F21S4/00	F21S4/00 Lighting devices or systems using a string or strip of light sources
A47G33/06	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees A47G33/06 Artificial Christmas trees
A47G33/12	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees A47G33/12 Christmas tree stands
A47G33/08	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees A47G33/08 Christmas tree decorations
F21V19/00	F21V19/00 Fastening of light sources or lamp holders
F21W121/04	F21W121/00 Use or application of lighting devices or systems for decorative purposes, not provided for in groups F21W121/04 for Christmas trees
F21S4/10	F21S4/00 Lighting devices or systems using a string or strip of light sources F21S4/10 with light sources attached to loose electric cables, e.g. Christmas tree lights
A47G33/04	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees
F21Y115/10	F21Y011500 Light-generating elements of semiconductor light sources F21Y115/10 Light-emitting diodes [LED]
F21S8/00	F21S8/00 Lighting devices intended for fixed installation

### 2.3.3 CHRISTMAS TREE PATENT TRENDS

The technology trend analysis identified Christmas tree stands and Christmas tree decorations as key areas of innovation. These areas were, therefore, explored further using CPC classifications to provide more granular information, with regards to the technology that is driving the innovation in these areas. Each section explores technology trends using a heatmap of patent filings in the last 20 years, with CPC classification definitions in the respective tables.

#### CHRISTMAS TREE DECORATIONS

It is evident that most patent filings related to Christmas tree decorations appear to be illuminated (A47G2033/0827), with a significant number of recent patent filings. There is also an increase in recent patent filings in a number of emerging areas, which include:

- Christmas tree decorations that are specially adapted for emitting sound (A47G33/0818)
- Christmas tree decorations involving motion (A47G33/0809)
- Christmas tree decorations comprising means for attaching to a lamp or candle holder (A47G33/0836)
- Christmas tree decorations comprising artificial snow (A47G33/0845)

- Christmas tree decorations consisting of elongated flexible decorations, e.g. tinsels, garlands, chains (A47G33/0863)

Table 4. Classification definitions.

CPC	Definition
A47G-2033/0827	A47G33/08 Christmas tree decorations A47G2033/0827 illuminated
A47G-2033/089	A47G33/08 Christmas tree decorations A47G2033/089 for the upper extremity of the central stem
A47G-033/08/09	A47G33/08 Christmas tree decorations A47G33/0809 involving motion
A47G-033/08/18	A47G33/08 Christmas tree decorations A47G33/0818 specially adapted for emitting sound
A47G-033/08/36	A47G33/08 Christmas tree decorations A47G33/0836 comprising means for attaching to a lamp or candle holder, e.g. reflectors, lamp shades
A47G-033/08/45	A47G33/08 Christmas tree decorations A47G33/0845 Artificial snow, ice or icicles
A47G-033/08/54	A47G33/08 Christmas tree decorations A47G33/0854 comprising fragrance releasing means
A47G-033/08/63	A47G33/08 Christmas tree decorations A47G33/0863 Elongated flexible decorations, e.g. tinsels, garlands, chains
A47G-033/08/72	A47G33/08 Christmas tree decorations A47G33/0872 comprising fire preventing means
A47G-033/08/81	A47G33/08 Christmas tree decorations A47G33/0881 comprising means related to watering of the tree

## CHRISTMAS TREE STANDS

Overall, it can be observed that most patent filings relate to Christmas tree stands comprising watering means, e.g. a water reservoir (A47G2033/1286), however, innovation in this field appears to have decreased significantly since 2016. Since the decrease in interest, a number of areas appear to be emerging, which include:

- Christmas tree stands involving electricity (A47G2033/122)
- Christmas tree stands allowing the tree to rotate or vibrate thereon (A47G33/126)
- Christmas tree stands that are stackable, foldable, collapsible, nestable or sale packaged (A47G2033/1266)

Table 5. Classification definitions.

CPC	Definition
A47G-2033/1286	A47G33/12 Christmas tree stands A47G2033/1286 comprising watering means, e.g. a water reservoir
A47G-2033/122	A47G33/12 Christmas tree stands A47G2033/122 involving electricity
A47G-033/12/06	A47G33/12 Christmas tree stands A47G33/1206 of self-clamping type

CPC	Definition
A47G-2033/1293	A47G33/12 Christmas tree stands A47G2033/1286 comprising watering means, e.g. a water reservoir A47G2033/1293 including water feeding or water level monitoring means
A47G-033/12/13	A47G33/12 Christmas tree stands A47G33/1213 comprising a single handle or pedal for releasing, tensioning or locking of clamping members
A47G-033/12/6	A47G33/12 Christmas tree stands A47G33/126 allowing the tree to rotate or vibrate thereon
A47G-2033/1266	A47G33/12 Christmas tree stands A47G2033/1266 Stackable, foldable, collapsible, nestable or sale packaged
A47G-033/12/26	A47G33/12 Christmas tree stands A47G33/1226 comprising a ball joint or similar fulcrum surface for straightening the tree
A47G-2033/1233	A47G33/12 Christmas tree stands A47G2033/1233 as insert for a plant pot
A47G-033/12/46	A47G33/12 Christmas tree stands A47G33/1246 supported on a surface other than a floor, e.g. wall, ceiling, or the like
A47G-2033/124	A47G33/12 Christmas tree stands A47G2033/124 comprising wedges
A47G-2033/1273	A47G33/12 Christmas tree stands A47G2033/1273 comprising transport wheels or the like
A47G-2033/1253	A47G33/12 Christmas tree stands A47G2033/1253 comprising pneumatic or hydraulic parts
A47G-2033/128	A47G33/12 Christmas tree stands A47G2033/128 for trees having a root ball

### 2.3.4 PRIORITY COUNTRIES

The top priority countries can be analysed to see where the patent applications are initially filed and claiming their priority from. This can be a good indication of the countries where the majority of research and innovation in a particular technology field is taking place, since organisations generally file patent applications first in the local territories where their research bases are located. Likewise, for universities the priority country will usually tend to be the country in which they are based.

In this instance, the landscape is dominated by the US, which accounts for approximately 36.34% of the patent landscape. It is followed by China which represents approximately 24.23% of all priority applications, which is closely followed by Germany (11.16%) and Japan (5.96%). This is higher than the number of GB priority applications, which accounts for approximately 4.39% of the patent landscape.

### 2.3.5 PROTECTION COUNTRY

Similarly, an analysis of the jurisdictions of granted active patents is a good indication of the leading markets in a given field. In this instance China is the leading jurisdiction, accounting for approximately 32.98% of all granted patents. It is followed by US which represents 19.64% of the patent landscape, and Germany which has approximately 6.52% of all granted patents. Great Britain represents approximately 3.14% of the patent landscape.



### 2.3.6 GLOBAL GRANT SUCCESS

An assessment of the proportion of granted patents compared to patent applications can give additional insight into the commercial value of a technology sector, and the stage of development of the market, as well as provide information on market entry and competition.

For the Christmas landscape, it is evident from the higher proportion of expired patent families that this is a more well-established area. The higher number of granted patent families also supports this, as well as showing that there is commercial value in the sector. However, the combination of the high number of lapsed patent families and the low number of pending patent applications, suggests that there is little space for new innovation.

### 2.3.7 TOP ASSIGNEES

Considering the global distribution of patent filings, it can be expected to see the patent landscape dominated by US and Chinese organisations. The following table highlights the top 10 assignees for the number of patents in relation to Christmas technologies, which represent both the top industry and academic organisations in the field in terms of patenting activity. It can be observed that most top players within the field appear to be commercial, which is a good indication of significant commercial and economic interest in the field. A summary of each patent portfolio is provided within this section.

Rank	Assignee/Applicant	Document Count	Organisation Type	Country
1	GANZHOU DONGFENG AUTOMATION EQUIPMENT CO LTD	50	Commercial	China
2	FUJIAN YINGHAO CULTURAL & CREATIVE	40	Commercial	China
3	MR CHRISTMAS INC	18	Commercial	US
4	POLYGROUP MACAU LTD BVI	17	Commercial	China
5	BEIJING INST GRAPHIC COMM	17	Academic	China
6	SHENZHEN GIMECH TECH CORPORATION	16	Commercial	China
7	HALLMARK CARDS	16	Commercial	US
8	ZHEJIANG SUNGIANT ARTS & CRAFTS CO LTD	15	Commercial	China
9	KRINNER INNOVATION GMBH	14	Commercial	Germany
10	HANGZHOU HANGFENG METAL PRODUCTS CO LTD	14	Commercial	China

**Ganzhou Dongfeng Automation Equip Co Ltd** (<http://www.dahengkongjiao.com/>) is owned by **Zhangzhou Blossom Precision Machinery**, wherein the company holds a patent portfolio that appears to be directed towards artificial Christmas tree manufacturing, with a specific focus on technology for simulating branches and leaves. The patent portfolio increased significantly in the last 5 years, with a focus on the Chinese market, wherein approximately 50% of the portfolio is granted with 3.8% pending patent applications.

**Fujian Yinghao Cultural & Creative** is a subsidiary of **Huakai Yibai Technology** (<http://www.huakai.net/>), wherein the company holds a patent portfolio that appears to focus on Christmas ball manufacturing, which includes a blow molding production line, as well as Christmas ball



inserting and rotating devices, automatic sorting mechanisms, spraying equipment, and ball packaging apparatus. The company portfolio increased significantly in the last 5 years, with a focus on the Chinese market, wherein approximately 85.7% of the patent portfolio is granted, while 12.7% appears to be pending.

**Mr Christmas Inc** (<https://mrchristmas.com/>) has filed a number of patents relating to collapsible artificial Christmas trees, Christmas tree decorations and tree lights. The patent portfolio is focused on the US market, wherein 10.5% of the patent filings are granted, with most of the patent portfolio not active.

**Polygroup Macau Ltd Bvi** (<https://www.polygroup.com/>) owns a diversified patent portfolio relating to decorative lighting systems, tree decorations and artificial Christmas trees. The company has filed a relatively consistent number of patents in the last 20 years, with a focus on the US, Chinese, Canadian, and European markets. The majority of the patent portfolio appears to be granted (63.64%), with a small number of pending patent applications (3.03%).

**Beijing Institute of Graphic Communication** (<https://sie.bigc.edu.cn/>) appears to have filed a number of printing methods and information storage devices, wherein the patent portfolio appears to be inactive.

**Shenzhen Gimech Tech Corporation** (<http://test.gimech.com/html/en/index.aspx>) holds a patent portfolio focused on artificial Christmas tree production equipment, branch distributing and feeding mechanisms, as well as sealing devices. The patents filed by the company appear to focus on the Chinese market, with a significant number of patent filings in the last 5 years, wherein approximately 81.25% of the portfolio is granted and 18.75% consists of pending patent applications.

**Hallmark Cards** (<https://www.hallmark.co.uk/>) has filed patents in relation to greeting card manufacturing apparatus, lighting devised used for decoration, and light string ornaments. The company patent portfolio is primarily focused on the markets, wherein approximately 15% of patent filings are granted and 5% consist of pending patent applications.

**Zhejiang Sungiant Arts & Crafts Co Ltd** (<http://www.sungiantchina.com/>) holds a patent portfolio that encompasses Christmas decorative lighting systems that could be waterproof and solar powered, as well as comprising wireless control. The patent portfolio increased significantly in the last 5 years, wherein approximately 94.01% of the patent portfolio is granted, with major focus on the Chinese, Australian and German markets.

**Krinner Innovation GmbH** (<https://www.krinner.io/>) holds patent portfolio is focused on Christmas tree stands and lighting systems, such as LED lamps and clamping and tensioning devices for Christmas tree stands. The number of patents filed by the company appears to have decreased, wherein only 6.7% of the patent portfolio appears to be granted, with a focus on the European markets.

**Hangzhou Hangfeng Metal Products Co Ltd** (<http://www.ailongmetal.com/>) has filed a number of patents relating to Christmas tree stands and supporting frames, wherein the company has filed an increasing number of patents in the last 5 years. The patent filings are primarily in China, wherein approximately 21.4% of the patent portfolio is granted.

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## UNITED KINGDOM

Since larger US, Chinese, and European corporations dominate the patent landscape, the dataset was filtered further to identify key UK players having patent portfolios relating to Christmas:

- **Scalable Designs Ltd** (<https://www.scalable-designs.co.uk/>)
- **Packway Industry Ltd** (<https://www.packway.com/>)
- **Capricorn Controls Ltd** (<http://www.capricorn-controls.com/>)
- **Manthorpe Engineering** (<https://manthorpeengineering.co.uk/>)

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### 2.3.8 TOP ASSIGNEE PATENT STRENGTH

The strength of an assignee's patent portfolio can be benchmarked by comparing the number of forward citations (forward citations are where a patent is referred to by a later filed patent) relative to the average age of the portfolio. Portfolios positioned further to the right side of this quadrant correspond to pioneers in the area studied and a position at the top right is indicative of a pioneer with a strong impact on the field studied (potential blocking player). The portfolios further to the left side of the quadrant are the portfolios of the newcomers. A position at the top left corresponds to a later entrant into the space who quickly became important in the field (strong impact).

Using this analysis for the top 10 assignees identified, we identified that Mr Christmas Inc and Krinner Innovation are the most well-established players in the field of Christmas, while Polygroup Macau is the most influential newcomer and Hallmark Cards is considered a pioneer with a strong impact. Disappointingly perhaps, Mr Christmas Inc does not have a North Pole filing address.

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### 2.3.9 TOP ASSIGNEE TECHNOLOGY FOCUS

The research focus of the top 10 assignees was analysed further, wherein the following heatmap examines innovation in key technology areas; classification definitions are listed in Table 4. The heatmap shows that the patent portfolio of Polygroup Macau is the most diversified, with most patent filings focused on artificial Christmas trees. The patent portfolio of Ganzhou Dongfeng Automation Equip Co Ltd also appears to be focused on artificial Christmas trees, while Krinner Innovation and Hangzhou Hangfeng Metal Products lead the Christmas tree stand market. On the other hand, the Christmas tree decoration area of the patent landscape appears to be dominated by Fujian Yinghao Cultural & Creative and Hallmark Cards, with Zhejiang Sungiant Arts & Crafts Co Ltd having most patent filings related to lighting devices for Christmas trees. Overall, there appears to be competition in all of the top 10 IPC classifications, with the least interest in lighting devices intended for fixed installation.

Table 6. Classification definitions.

IPC	Definition
F21S4/00	F21S4/00 Lighting devices or systems using a string or strip of light sources
A47G33/06	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees A47G33/06 Artificial Christmas trees
A47G33/12	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees A47G33/12 Christmas tree stands
A47G33/08	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees A47G33/08 Christmas tree decorations
F21V19/00	F21V19/00 Fastening of light sources or lamp holders
F21W121/04	F21W121/00 Use or application of lighting devices or systems for decorative purposes, not provided for in groups F21W121/04 for Christmas trees
F21S4/10	F21S4/00 Lighting devices or systems using a string or strip of light sources F21S4/10 with light sources attached to loose electric cables, e.g. Christmas tree lights
A47G33/04	A47G33/00 Religious or ritual equipment in dwelling or for general use A47G33/04 Christmas trees
F21Y115/10	F21Y011500 Light-generating elements of semiconductor light sources F21Y115/10 Light-emitting diodes [LED]
F21S8/00	F21S8/00 Lighting devices intended for fixed installation

## 2.4 LANDSCAPE MAP

Derwent Innovation can be used to generate sophisticated patent landscapes to visualise the relationship between patents in a common technology area based on key words within the claims and/or abstracts/text of individual patents within the searched field. This can be used to locate competing or similar patents to the patents of interest. As with a geographic landscape the contour lines and intensity of peaks on the patent landscape represent areas of high patent activity with closely related concepts.

The set of INPADOC patent families identified in the landscape search discussed above was mapped using Derwent Innovation's proprietary ThemeScape™ mapping tool. ThemeScape uses term frequency and other algorithms to cluster documents based on shared language – in this case the English Title from the patents together with the Titles and Abstracts were mapped. It uses several algorithms to perform terminology-based clustering. The text from each record is compared with the text from all other patent records within the search collection. The map uses vectors to give each patent record a proximity score to all of its peers. The outcome of this analysis is a visualisation of the patent space with each patent (dot) represented once in the map, with patents in close proximity sharing more phraseology than those located apart. Each peak is labelled with the key terminology concepts contained in the patents within the cluster. We used the Themescape tool on the Landscape

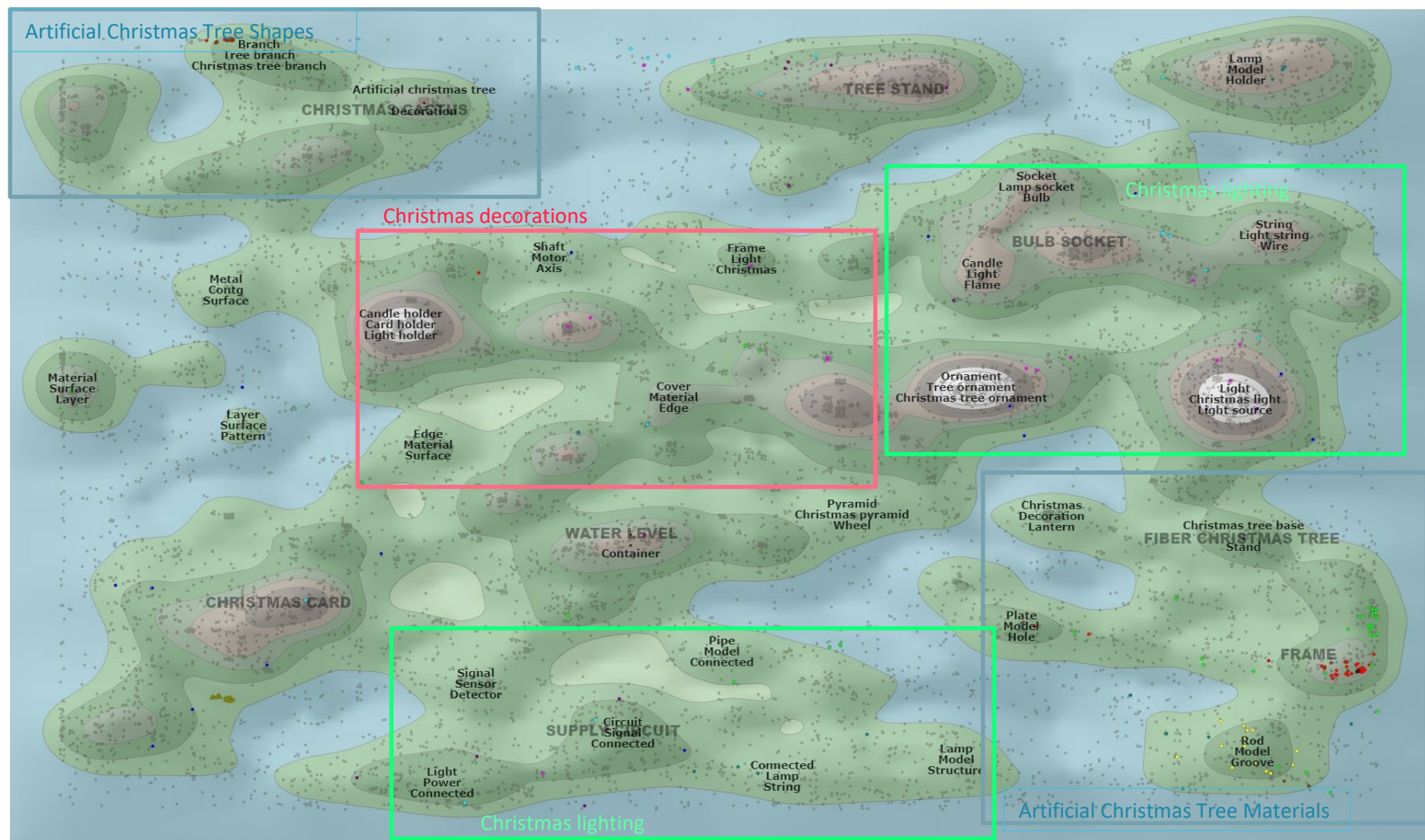
Search patent set, mapping one representative patent from each of the INPADOC families. The resulting map is shown below, with some broad subject areas highlighted. This allows us to identify some broad areas of interest in the field, represented by the highest “peaks” on the map.

Although the landscaping is not a precise tool, it is possible to identify clusters of technology areas on the map and this can be a useful tool for analysing both trends and also who is operating in a particular patent field. This can be a way to visualise and start to identify both potential freedom to operate issues and/or identify potential collaborators and licensees who have similar patented technologies and interests.

In this instance, the landscape map was used to identify areas of high patent coverage and areas of low patent coverage, as well as gain insight into the position of the patent portfolios of top three key players. Interestingly, areas with most patent filings appear to relate to artificial Christmas trees, tree stands, lighting systems, ornaments, and Christmas cards. The patent portfolio of Polygroup Macau appears to be most diversified, with patent filings in most key areas. The patent portfolio of Ganzhou appears to dominate areas relating to Christmas tree structural and frame components, with significant interest in the area from Fujian Yinghao Cultural & Creative. Most notable observations also include Krinner Innovations having the most patent filings in the area relating to tree stands, while Mr Christmas holds a patent portfolio most concentrated in areas relating to ornaments, and Hallmark cards leading innovation relating to Christmas cards.

*Please see the following key, which gives information on the top industry assignees illustrated on the landscape map:*

Assignee	Colour
<b>Ganzhou Dongfeng Automation Equipment Co Ltd</b>	Red
<b>Fujian Yinghao Cultural &amp; Creative</b>	Light Green
<b>Mr Christmas Inc</b>	Pink
<b>Polygroup Macau Ltd Bvi</b>	Light Blue
<b>Beijing Inst Graphic Comm</b>	Light Brown
<b>Shenzhen Gimech Tech Corporation</b>	Dark Brown
<b>Hallmark Cards</b>	Dark Blue
<b>Zhejiang Sungiant Arts &amp; Crafts Co Ltd</b>	Dark Green
<b>Krinner Innovation Gmbh</b>	Purple
<b>Hangzhou Hangfeng Metal Products Co Ltd</b>	Yellow

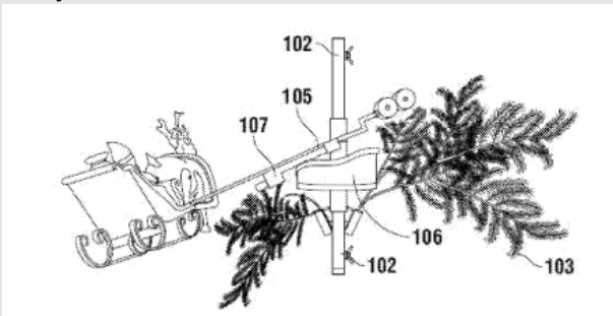
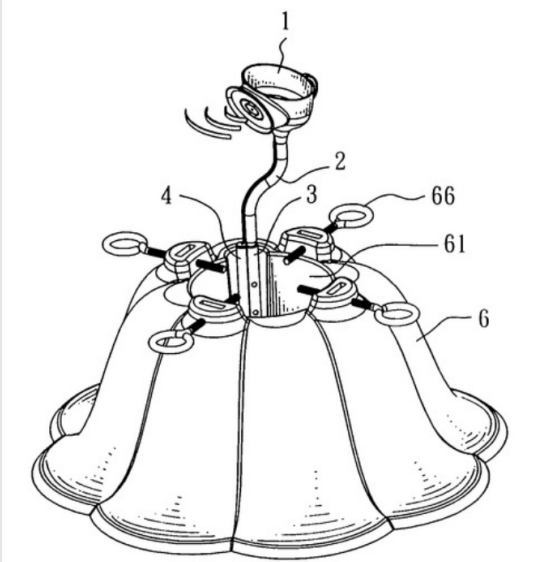


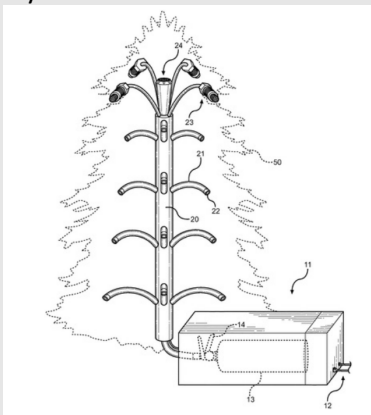
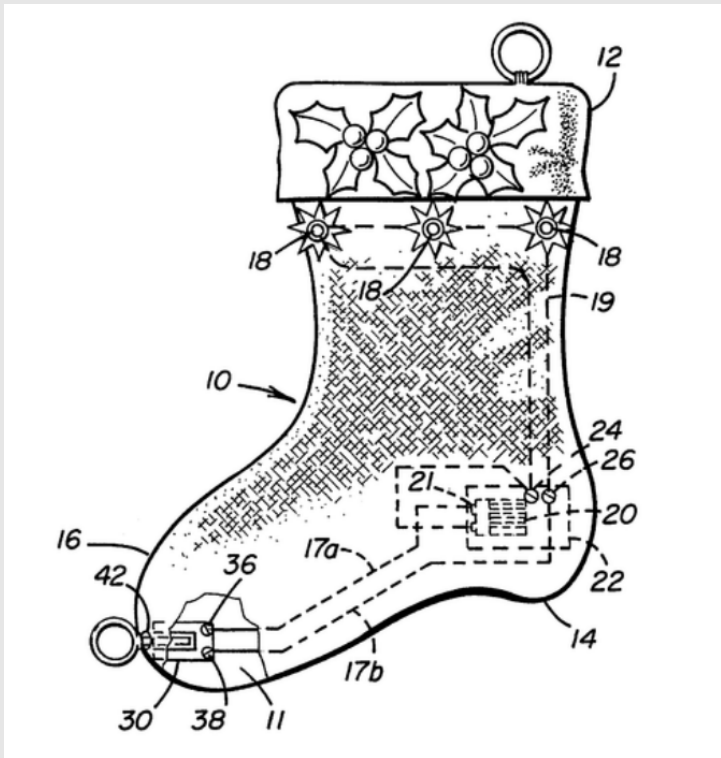
**Fig 1. Thescape map for Christmas technologies (Derwent Innovation).** Each dot indicates the location of an INPADOC patent family on the map. The map has been overlaid with the key areas in which the patents fall on the map.



## 2.5 RELEVANT RESULTS

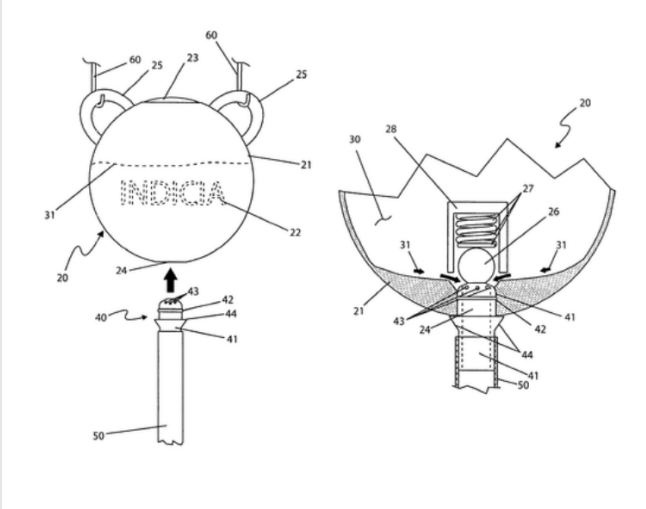
The following table highlights exemplar Christmas-related patents which we consider to be of particular interest to those looking for a novel approach to celebrate Christmas.

Publication Number	Title (English)	Assignee	Publication Date
<a href="#">US2022183493A1</a>	Smart christmas tree	NAWARATNE KOSALA	2022-06-16
<b>Summary/Abstract</b> – A decorative artificial tree comprising: a base stand; a plurality of connectable trunk sections; a plurality of leaved branch sections connectable to the trunk sections; a decorative object; a microcontroller; and, a motorised rotary mechanism comprising a support bar connected thereto, at one end of the support bar there is a counterweight, at the opposing end of the support bar the decorative object is attached; such that, in use when the motorised rotary mechanism is activated, the decorative object travels around the decorative tree.			
			
<a href="#">US2006174967A1</a>	Smart tree stand with water filling device	CHIEN CHAO CHUAN	2006-08-10
<b>Summary/Abstract</b> –A smart water filling device comprising: a vessel, having an outlet and a space extended outwardly from one side of the vessel; a tube, one side coupled to the outlet; a float device, having a housing and a float, wherein the float is disposed inside the housing and the housing has at least one opening and one side of the housing is connected to the other side of the tube; a control device, having a housing and a control circuit, wherein the housing is positioned beside the housing of the float device and the control circuit is disposed therein; and a warning device, disposed inside the space and coupled to the control circuit; whereby while the water being filled into the vessel, the control circuit can detect the position of the float and determine the water level inside the float device, and alarm to the user by way of using the warning device.			
			

Publication Number	Title (English)	Assignee	Publication Date
<a href="#">US2014138107A1</a>	Christmas tree fire extinguishing and alert system	DYSON III WILLIAM E	2014-05-22
<p><b>Summary/Abstract</b> – A Christmas tree fire extinguishing system is provided, wherein an automatically initiated fire extinguishing agent is contained within a housing below the tree and a plurality of smoke and heat sensors communicate to a control unit. The control unit controls the trigger and interprets the sensor signals, while also sending signals to a communications system upon a fire event to notify the homeowner and/or the local fire authorities. In combination with the fire extinguishing agent, the system can monitor the tree and alert property authorities in the event of a fire to prevent home fires and major property damage. Also provided is an audible fire alert for those in the home, wherein a sound generator is energized if smoke or fire is detected to warn those in the immediate vicinity.</p>			
			
<a href="#">US5523741A</a>	Santa Claus detector	CANE THOMAS	1996-06-04
<p><b>Summary/Abstract</b> – A children's Christmas Stocking device useful for visually signalling the arrival of Santa Claus by illuminating an externally visible light source having a power source located within said device.</p>			
			
<a href="#">US7757435B1</a>	Christmas tree watering ornament		2010-07-20

Publication Number	Title (English)	Assignee	Publication Date
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**Summary/Abstract** – A decorative Christmas tree ornament which functions as a funnel system to aid in the watering of the tree is herein disclosed. The ornament comprises a flip-open lid, thus exposing an interior reservoir. The ornament itself takes the form of a common Christmas icon such as a snowman, an angel, a bell, a gingerbread man, a globe or the like. The bottom of the reservoir is connected to a section of tubing approximately four (4) to five (5) feet long. The tubing is routed along the branch and down the trunk where it empties into a conventional Christmas tree stand supplied with a water basin. The tubing and ornament are held in place with a plurality of clips. Thus, to water the tree, one simply opens the ornament, pours in a quantity of water and walks away. The system is viewed as being particularly useful for trees that are difficult to reach, or for people who have difficulty in bending over, kneeling or crawling under a Christmas tree.



<a href="#">US2008299533A1</a>	Naughty or nice meter	ORSINI FRANK C	2008-12-04
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**Summary/Abstract** – The "Naughty or Nice Meter" is a visual novelty toy designed to let Children know where they stand on a "Naughty or Nice Meter". Originally conceived for Christmas, the "Naughty or Nice Meter" has widespread applications and can be used for other seasons of the year or events. The device has twelve (12) behavioral questions children will be graded on. The grading system for each question is a point scale from zero thru five. Zero (0) being the worst (Naughty) score and five (5) being the best (Nice) score. A calculator is used to add/subtract the total number of points accumulated for all twelve (12) questions. The meter is categorized in five number ranges (0-35; 36-41; 42-47; 48-53; 54-60). Each range signifies a different percentage grade of naughty to nice. The "Meter" lights up/down to the numbered range displayed according to the total number accumulated by the calculator.



<a href="#">GB2370501A</a>	Artificial christmas trees	KIMSEY PAUL	2002-07-03
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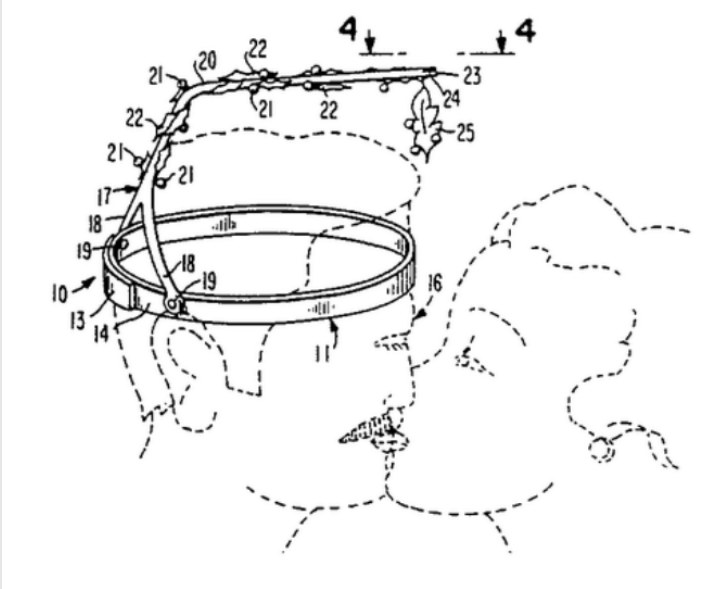
Publication Number	Title (English)	Assignee	Publication Date
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**Summary/Abstract** – A Christmas tree has branches formed in different colours representative of a sports club. Decorations with a sporting theme are provided, such as flat shapes bearing a sporting image and having a corresponding profile. Baubles are shaped and painted to represent sports balls, and lengths of tinsel may have integral shapes which represent sporting items.



<a href="#">US4488316A</a>	Mistletoe supporting headband	MOSCA RONALD J	1984-12-18
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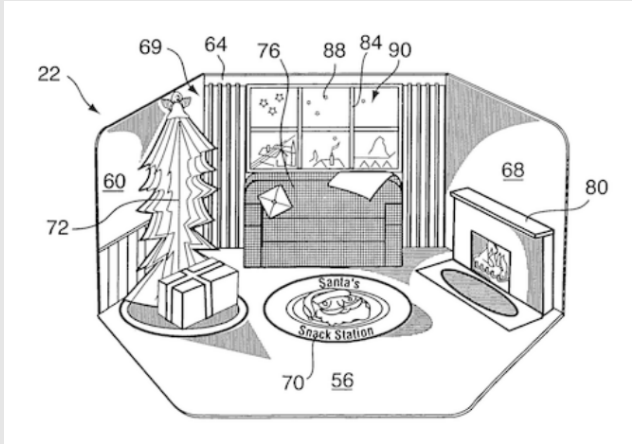
**Summary/Abstract** – This novel and unique headband device serves to support a fresh piece of mistletoe in front of its wearer's head. Primarily, it consists of a strip of material, which is suitably fastened to the head of the wearer, and it also includes a fork member, having an opening for receiving the mistletoe, which is disposed of after its use. The headband may also be used for supporting other decorative or novelty items.



<a href="#">US2006046603A1</a>	Santa Claus visit kit	COLAK JOHN I	2006-03-02
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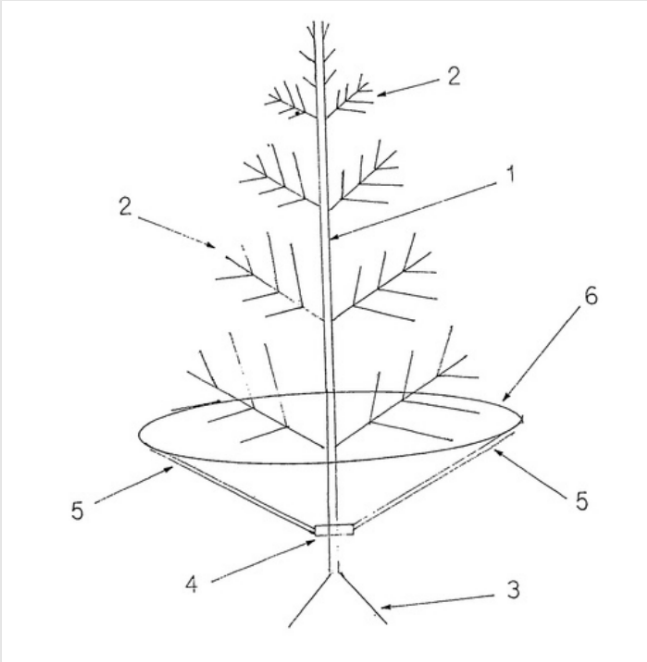
Publication Number	Title (English)	Assignee	Publication Date
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**Summary/Abstract** – A kit for creating an illusion that suggests a Santa Claus visit in a premises is disclosed. The kit includes items revealed to a child audience. These items include a displayer at which small items can be placed, and amusement items for use by at least a member of the child audience in carrying out steps that the child audience is invited to believe will assist Santa Claus in making the visit. The kit also includes items at least temporarily concealed from the child audience. The concealed items include means for making boot print resembling marks to mark an illusionary trail of Santa Claus in the premises.



<a href="#">GB2265083A</a>	Christmas tree debris collection device	SUTHERLAND STUART DEANE	1993-09-22
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**Summary/Abstract** – A Christmas tree foliage and debris fall collection device comprises a support 3 for a Christmas tree 1 together with a foliage and debris collection vessel 5 beneath the tree, extending outwardly from the attachment 4 of the support to the trunk of the tree to receiving falling foliage or debris.



### 3 APPENDIX

#### 3.1 SEARCH STRINGS

Search Strategy	Patent Families
Landscape (Derwent Innovation)	
CTB=(christmas*) NOT (AIC=(B63* OR E02* OR E21* OR F01* OR F02* OR F03* OR F04* OR F05* OR F15* OR F16* OR F17*) OR CTB=((subsea* OR sea OR underwater* OR (under ADJ2 water*) OR oil OR oilwell) NEAR5 (Christmas* ADJ2 tree)));	12,749

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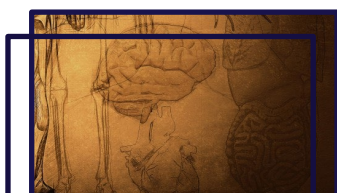


## Industry Expertise



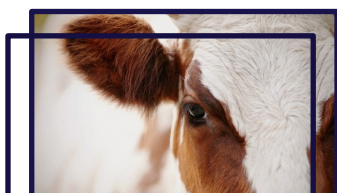
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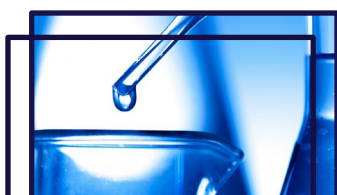
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31-35 Kirby Street, London, EC1N 8TE  
+44 (0)20 3176 0580

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EH2 2AZ

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